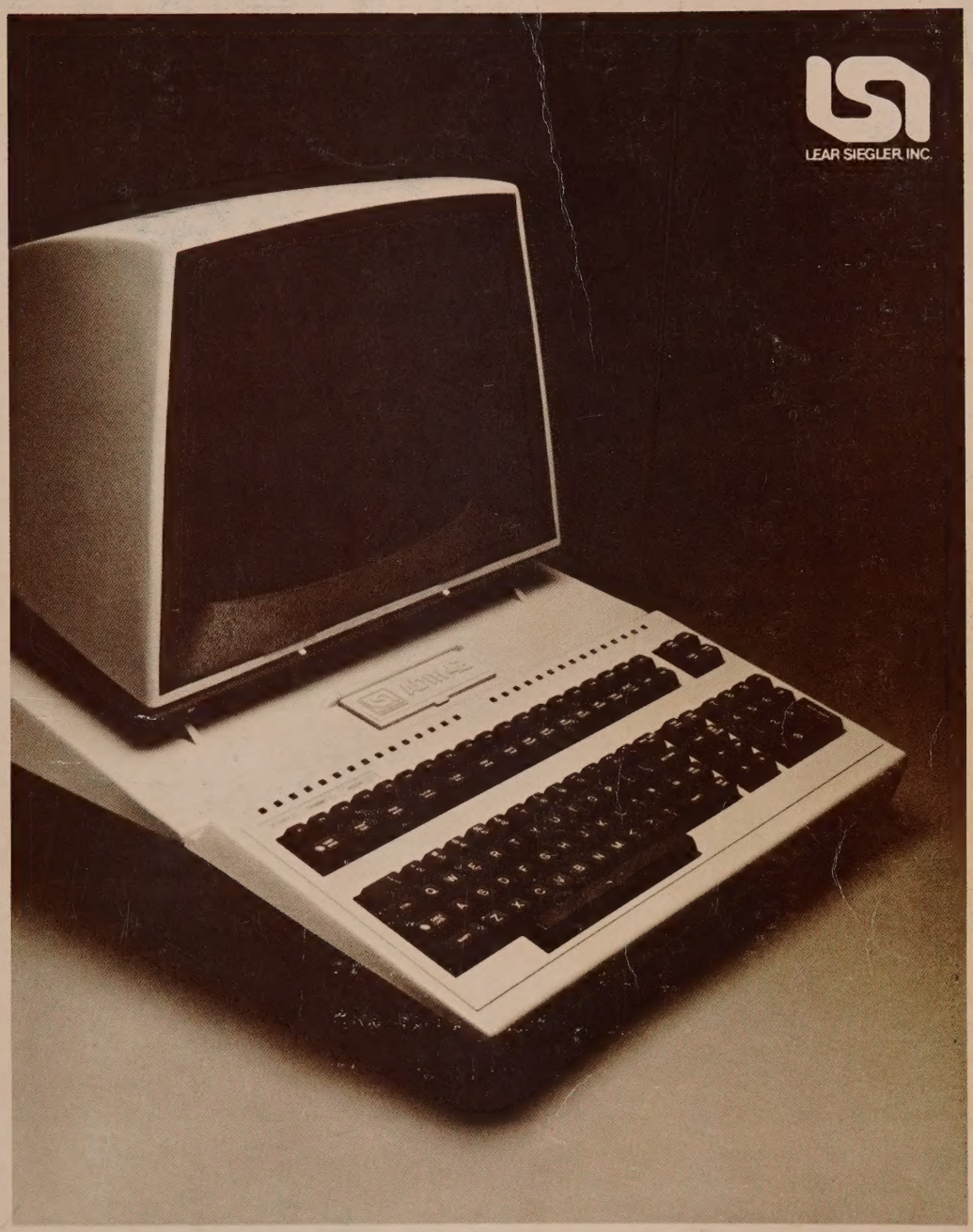
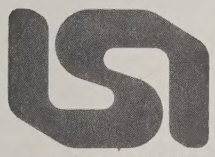


ADM-42
Data Display Terminal
Users Reference Manual

LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION
714 NORTH BROOKHURST STREET, ANAHEIM, CALIFORNIA 92803

ADM-42
data
display terminal



LEAR SIEGLER, INC.

USERS REFERENCE MANUAL

DP-110
©1979 LEAR SIEGLER, INC.
FEBRUARY 1980

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_08633

TABLE OF CONTENTS

SECTION			PAGE
1	GENERAL DESCRIPTION		1-1
	1.1	INTRODUCTION	1-1
	1.2	PURPOSE AND USE	1-1
	1.3	OPERATIONAL DESCRIPTION	1-2
		1.3.1 Regulated Power Supply	1-2
		1.3.2 Keyboard	1-4
		1.3.3 Control Section (CPU)	1-4
		1.3.4 Video Logic and Control	1-4
		1.3.5 External Interface	1-4
		1.3.6 System Configuration Switches	1-5
	1.4	PHYSICAL DESCRIPTION	1-5
	1.5	SPECIFICATIONS	1-6
		1.5.1 Transmission Modes	1-6
		1.5.2 Character Format	1-10
		1.5.3 Word Structure	1-10
		1.5.4 Configuration Control	1-10
	1.6	ADM-42 OPTIONS	1-14
	1.7	RELATED DOCUMENT	1-17
2	INSTALLATION		2-1
	2.1	INTRODUCTION	2-1
	2.2	SAFETY REQUIREMENTS	2-1
	2.3	SITE REQUIREMENTS	2-1
	2.4	UNPACKING AND INITIAL INSPECTION	2-2
	2.5	INITIAL PREPARATION	2-2
		2.5.1 Line Voltage Selection	2-2
		2.5.2 Configuration Control Switch Settings	2-2

TABLE OF CONTENTS (continued)

SECTION			PAGE
	2.6	INTERFACE INFORMATION STANDARD PCBA.....	2-3
		2.6.1 MODEM Port Interface.....	2-3
		2.6.2 EXTENSION Port Interface.....	2-3
	2.7	INTERFACE INFORMATION, OPTION PCBA.....	2-3
		2.7.1 PARALLEL PRINTER Port Interface.....	2-3
		2.7.2 ASYNCHRONOUS PRINTER Port Interface.....	2-3
		2.7.3 SYNCHRONOUS Port Interface.....	2-3
	2.8	INSTALLING THE ADM-42.....	2-10
	2.9	TURN-ON AND TURN-OFF PROCEDURES.....	2-10
3		OPERATING INSTRUCTIONS.....	3-1
	3.1	INTRODUCTION.....	3-1
	3.2	KEYBOARD FUNCTIONS.....	3-1
		3.2.1 Terminal Control Keys.....	3-3
		3.2.2 Alphanumeric Keys.....	3-8
		3.2.3 Special Character Keys.....	3-8
		3.2.4 Operational Control Keys.....	3-8
	3.3	CURSOR CONTROL OPERATIONS.....	3-9
	3.4	DATA EDITING CONTROL OPERATIONS.....	3-10
		3.4.1 Editing Examples.....	3-13
	3.5	DATA TRANSMISSION CONTROL OPERATIONS....	3-16
		3.5.1 Transmission (Baud) Rates.....	3-16
		3.5.2 Block Mode Transmission.....	3-16
		3.5.3 Example of Block Mode Transmission.....	3-17
		3.5.4 Conversation Mode Transmission.	3-18
		3.5.5 Example of Conversation Mode Transmission.....	3-19
		3.5.6 Serial Print Mode Transmission.	3-20
		3.5.7 Parallel Print Mode Transmission.....	3-22
		3.5.8 Buffered Print Mode Transmission.....	3-22
		3.5.9 ADM-1 Mode Transmission.....	3-22
		3.5.10 Polling Mode Transmission.....	3-22

TABLE OF CONTENTS (continued)

SECTION			PAGE
3.6	PROGRAM MODE		3-22
3.7	SPECIAL ADM-42 CHARACTERISTICS		3-23
	3.7.1	Protected Fields/Characters	3-23
	3.7.2	Status Line Characteristics	3-24
3.8	PROGRAMMING CONSIDERATIONS		3-25
	3.8.1	CTRL Key Operations	3-25
	3.8.2	ESC Key Operations	3-38
	3.8.3	Function Key (FUNKEY) Operations	3-38
	3.8.4	Personality Control Operations	3-42
	3.8.5	Terminal/Mode Control Operations	3-46
	3.8.6	Cursor Control Operations	3-47
	3.8.7	Format Control Operations	3-48
	3.8.8	Data Editing Control Operations	3-49
	3.8.9	Data Transmission Control Operations	3-51
	3.8.10	Video Attribute Control	3-53
3.9	STANDARD (ADM-2) POLLING		3-55
	3.9.1	Setting ADM-42 Address	3-55
	3.9.2	Standard (ADM-2) Polling Operations	3-55
	3.9.3	Removing Terminal from Standard Polling Status	3-57
	3.9.4	Initiating Standard Polling Sequence	3-58
	3.9.5	Standard (ADM-2 Compatible) Responses	3-58
3.10	SPECIAL POLLING OPERATIONS		3-70
	3.10.1	GROUP POLL Operations	3-70
	3.10.2	GROUP SELECT Operations	3-71
	3.10.3	MULTI-POINT CONTENTION Operations	3-71
	3.10.4	Addressable Printer Port Operations	3-71

TABLE OF CONTENTS (continued)

APPENDIX A

	PAGE
Operator's Quick Reference Guide To Baud Rate Change...	A-1
Operator's Quick Reference Guide To Personality Change.	A-2
Operator's Quick Reference Guide To Video Attribute Control Sequence.....	A-4
Operator's Quick Reference Guide To CTRL Key Sequence..	A-5
Operator's Quick Reference Guide To Graphic Character Set Codes.....	A-6
Operator's Quick Reference Guide To Escape Sequence....	A-7
Operator's Quick Reference Guide To Absolute Cursor Positioning Sequence.....	A-8
Operator's Quick Reference Guide To FUNKEY Programming.	A-9
Operator's Quick Reference Guide To Buffered Print Mode.....	A-10

LIST OF FIGURES

FIGURE		PAGE
1-1	ADM-42 Data Display Terminal.....	viii
1-2	ADM-42 Data Flow Block Diagram.....	1-3
1-3	ADM-42 Character Format (By Ascending ASCII Codes) With HEX Code.....	1-11
1-4	Word Format Codes With DIP Switch Configuration.	1-12
1-5	Standard PCBA Component and Interface Connector Locations.....	1-15
1-6	Option PCBA Component and Interface Connector Locations.....	1-17
2-1	Typical ADM-42 Interfaces.....	2-4
2-2	ADM-42 Standard PCBA Interface Logic.....	2-5
2-3	Option PCBA CPU Bus Extension Interface Connector/Pin List.....	2-6
2-4	Option PCBA Parallel Printer Port Interface Logic.....	2-7
2-5	Option PCBA Asynchronous Serial Printer Port Interface Logic.....	2-8
2-6	Option PCBA Synchronous Port Interface Logic....	2-9
2-7	Location of ADM-42 Controls and Interface Connectors.....	2-12
3-1	ADM-42 Data Display Terminal Standard Keyboard..	3-2
3-2	ADM-42 Standard Graphic Character Set, Showing Comparable CTRL Codes.....	3-26
3-3	ADM-42 Escape Sequence Characters, With HEX Coding.....	3-40

LIST OF FIGURES (continued)

FIGURE		PAGE
3-4	Chart of Absolute Cursor Positioning Codes.....	3-50
3-5	POLL Function Dialogue, Flow Diagram.....	3-59
3-6	SELECT Function Dialogue, Flow Diagram.....	3-62
3-7	SEQUENTIAL SELECT Function Dialogue, Flow Diagram.....	3-64
3-8	FAST SELECT Function Dialogue, Flow Diagram....	3-66
3-9	BROADCAST SELECT Function Dialogue, Flow Diagram.....	3-67
3-10	SEND Function Dialogue, Flow Diagram.....	3-69

LIST OF TABLES

TABLE		PAGE
1-1	ADM-42 Specifications.....	1-7
2-1	ADM-42 Controls and Interface Connectors.....	2-13
3-1	Keyboard Operations.....	3-4
3-2	Editing Example.....	3-14
3-3	Special Control Operations.....	3-27
3-4	Dynamic Baud Rate Codes.....	3-54

PREFACE

This Operator's Manual describes the function and operation of the ADM-42 Data Display Terminal. The instructions and information are presented to aid operational personnel in the installation, operation, and care of the ADM-42. All operator controls are described in detail, and remote programming considerations are presented in sufficient detail to enable an experienced operator to use the equipment efficiently when confronted with non-standard applications.

The major topics described in the manual include:

Section 1 General Description

Section 2 Installation

Section 3 Operation

Figure 1-1. ADM-42 Data Display Terminal

SECTION 1

GENERAL DESCRIPTION

1.1 INTRODUCTION

This section contains a description of the primary functions of the Lear Siegler ADM-42 Data Display Terminal (see figure 1-1), along with physical dimensions, specifications and ranges, and operating features.

1.2 PURPOSE AND USE

There are numerous applications of the ADM-42, all involving the transfer of data. Data transfer, in some applications, may be almost exclusively unidirectional; either from the ADM-42 to the computer, or from the computer to the ADM-42. A more frequent application of the ADM-42, however, is one in which an operator communicates with a computer, and the computer responds in accordance with its stored program.

The ADM-42 has the following general capabilities:

- Full 128 ASCII character set with 80 x 25 character display
- User controlled status display on Line 25
- Full ADM-2 compatibility
- 15 transmission rates
- Conversational and Block Mode transmission
- Data key roll-over protection
- 39-Key special functions keyboard
- 15-Key numeric keyboard
- Separate cursor control keys
- Up to eight full pages of memory

- Program Mode
- Special control character sequences
- Full editing, formatting, and protected fields capabilities
- Variable 10-or 11-bit word structures
- Dynamic behavior (personality) modification
- Selectable refresh rate
- Reversed, blinking, and blanked fields, with underlining
- Standard RS-232-C interface, RS-232-C extension, and 20-ma current loop; optional line printer, polling, and synchronous interfaces

1.3 OPERATIONAL DESCRIPTION

The ADM-42 is a microprogram-controlled device which provides a means of communicating with a remote computer, and which allows the user full control of the content and format of data entered by means of the keyboard. Figure 1-2 illustrates the flow of data through the functional areas of the ADM-42.

The Standard ADM-42 consists of a power supply, keyboard, control section (CPU), video logic and control, CRT display, configuration control switches, and external interface logic. The interface logic permits the following interfaces: an RS-232-C or 20-ma current loop interface through the MODEM port; daisychained devices through the EXTENSION (and MODEM) port; an optional polling interface through the MODEM port; a parallel or serial printer interface through the AUXILIARY port; and a data set or teletype interface through the SYNCHRONOUS port.

1.3.1 Regulated Power Supply

The ADM-42 power supply is a 65-watt regulated and unregulated power supply mounted on a printed circuit borad which is adjacent to the main printed circuit board assembly. Three regulated dc voltages are furnished for use by the CPU: +5 volts, and $\pm$12 volts. Unregulated +5-volt dc power is also supplied and for keyboard circuits. The power supply can accept line voltage inputs of 115 Vac or 230 Vac (with 230 volt transformer and connections.)

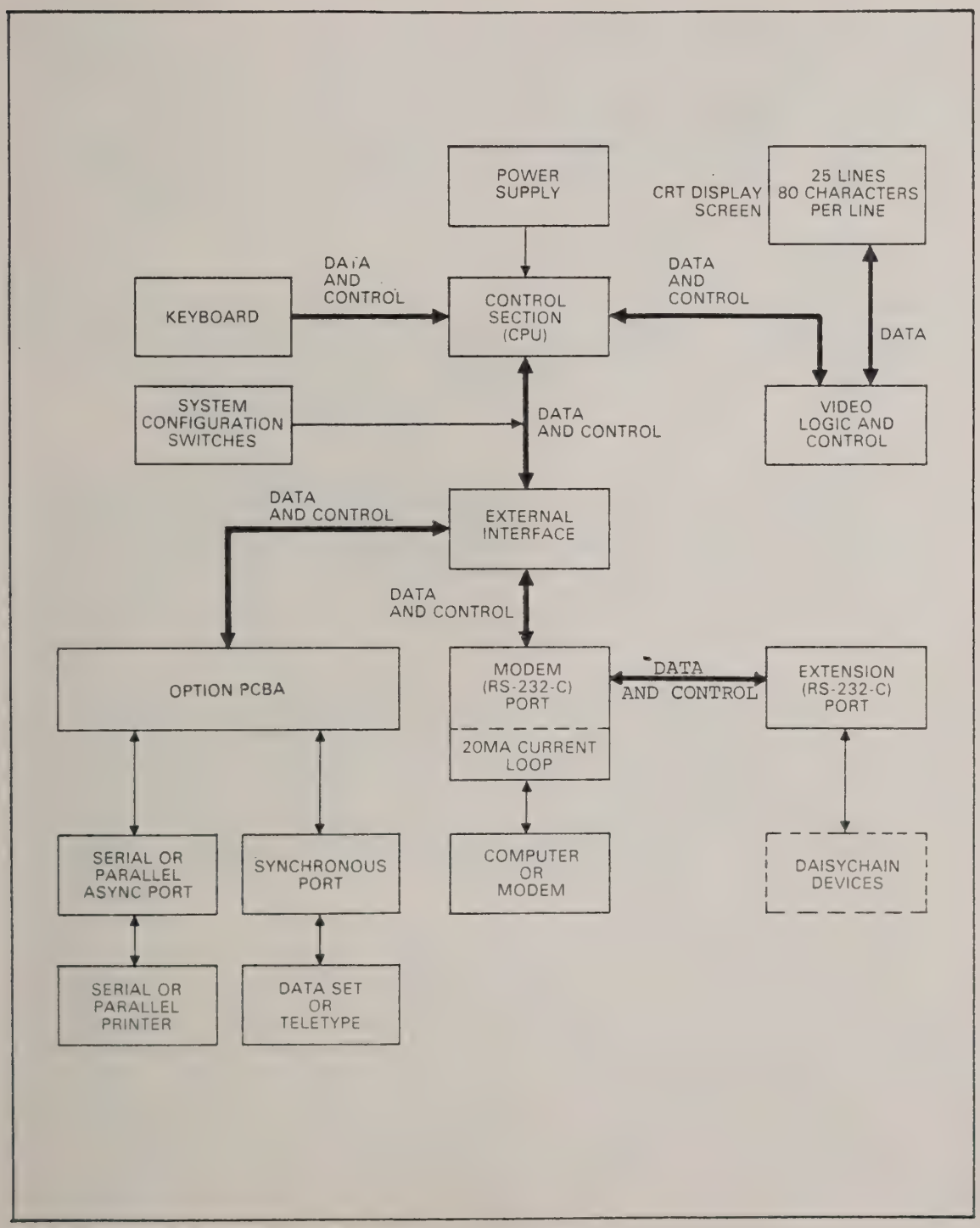


Figure 1-2. ADM-42 Data Flow Block Diagram

1.3.2 Keyboard

Data to be processed by the terminal is either from the keyboard or is sent from the remote computer. Keyboard entry is made using one of the 118 keys on the keyboard. Each keystroke is encoded into a parallel number which the CPU uses to determine the eventual ASCII or operational character to be developed and used. Accompanying the character is a keystroke which alerts the program that a character is to be input from the keyboard.

1.3.3 Control Section (CPU)

The Control Section (CPU) contains the microprocessor and various integrated circuits which control all the operations of the ADM-42. These operations include: timing and control, data handling and storage, interpreting and responding to control commands from the keyboard and the computer, video control, I/O interfacing, and status control.

Data entered from the keyboard is placed on the Data Bus and sent to the CPU section, which contains the microprocessor and various other integrated circuits and switches. The CPU, executing a stored read only memory (ROM) program, decodes the input data and reformats it into data and control instructions for the video logic and control section.

1.3.4 Video Logic and Control

The Video Logic and Control section contains the display logic needed to drive the CRT, 4k of random access memory (RAM), and character generation circuits, as well as the video logic and 15-inch monitor. The monitor screen can display 25 lines (including one status line) of data containing as many as 80 characters per line. Data from the CPU is written into the video RAM; control instructions from the CPU cause the contents of the RAM to be periodically displayed on the CRT screen.

1.3.5 External Interface

Data and control information from a remote computer is routed through the MODEM port to the external interface section, and then to the CPU. The CPU causes data to be displayed on the CRT in the same manner as the keyboard data. The interface contains the logic circuitry appropriate for interfacing with RS-232-C point-to-point signals, 20-ma current loop signals, modem logic, and daisychained devices. An option PCBA provides circuits for an RS-232-C serial or parallel printer interface and for a data set or teletype (TTY) interface. The external interface also contains the baud rate clock and baud rate switches which permit the ADM-42 to receive or transmit data at selected baud rates from 50 to 9600 baud.

The ADM-42 transmits data by retrieving data from the video RAM and placing it on the Data Bus for routing to the CPU. The CPU reformats the data and routes data and control information to the external interface section over the Data Bus. External interface logic is used to prepare the data and control information for transmission to the appropriate device connected.

1.3.6 System Configuration Switches

Several banks of system configuration switches are provided to control various attributes and characteristics of the ADM-42. The switches are mounted on the standard and option PCBAs. The characteristics thus controlled include: mode of transmission/ reception, parity, word structure, refresh rate, cursor/display attributes, and polling addresses and modes.

1.4 PHYSICAL DESCRIPTION

The ADM-42 Data Display Terminal is a complete operational unit. The terminal consists of three major assemblies: electronics unit, keyboard unit, and monitor unit. The electronics unit contains all the basic logic circuitry, baud rate switches, power supply, fan, cabling, and interface connectors. The standard and option PCBA's are contained in this unit. At the rear of the unit are located the interface connectors, RESET switch, ON/OFF switch, fuse, and power cord.

The keyboard contains 118 alpha numeric and special character keys which are generally arranged like a standard typewriter. The keyboard and the accompanying solid state logic circuits are used to generate the 128 ASCII characters in the standard ADM-42 character set. Included in this character set are 32 control characters which can be produced by special key operations. A roll-over feature is incorporated in the keyboard to protect against mis-keying. (If a second key is pressed before the key first pressed is released, the second code will not be transmitted until the first key has been released.) The keyboard may be physically moved several feet away from the main terminal without interrupting operations.

The PCBA(s) containing the microprocessor, memory, and logic is (are) the source of all control and coordinating activities in the ADM-42. These circuits transfer keyboard information into the display memory, display the contents of the memory on the CRT, recognize control commands typed at the keyboard, and execute the commands. The circuits also supervise communications to and from the remote computer and recognize control commands received through the terminal interfaces.

The monitor is a fully transistorized unit featuring printed circuit board construction. The display screen is a 15-inch diagonal cathode ray tube (CRT) similar to that of a black-and-white television receiver. The display is a high resolution matrix of 80 x 25 characters consisting of large letters, numbers, and other symbols. Information on display is refreshed at 50 Hz or 60 Hz, depending on the line frequency. (an internally located DIP switch must be appropriately set at installation.) Brightness and contrast are individually adjustable by means of controls on the monitor. The monitor may be physically moved several feet from the main terminal without interrupting operations.

The power supply, providing three regulated and one unregulated dc voltages for use by the main PCBA circuits, is contained on its own printed circuit board and mounted near the main PCBA. The four outputs have a total power rating of 63 watts. The ac input voltage may be either 115 volts or 230 volts at 50 or 60 Hz. DC output voltages are as follows:

- +5 volts at 1 ampere maximum load, unregulated
- +5 volts at 9.0 amperes maximum load, with $\pm$5% regulation and overload protection
- +12 volts at 0.75 ampere nominal load, with $\pm$5% regulation
- -12 volts and 0.4 ampere nominal load, with $\pm$5% regulation

1.5 SPECIFICATIONS

Table 1-1 lists the leading specifications for the ADM-42. In addition, several operational features, such as various transmission modes, character format, word structure, and configuration control are discussed in the paragraphs that follow.

1.5.1 Transmission Modes

Various transmission modes are utilized by the ADM-42; these include the Block and Conversation Modes. The Block Mode permits the operator to edit and perform off-line operations, and then come on-line for the actual transmission of the data. Processing time is limited to the actual transmission time only. In the Conversation Mode, either full-duplex or half-duplex operation is possible. Block and Conversation Modes are selected through the escape (ESC) sequences, or by using the CONV MODE key.

Table 1-1. ADM-42 Specifications

SPECIFICATION	DESCRIPTION
Input Power:	
Standard	115 volts ±10%, 50/60 Hz; Single Phase; 3-wire
Optional	230 volts ±10%, 50/60 Hz; Single Phase; 3-wire
Power Dissipation	65 watts, nominal (rated: 0.75A at 120 volts)
Operating Temperature	Between 41°F (5°C) and 122°F (50°F)
Relative Humidity	From 5% to 95% non-condensing
Altitude	Up to 10,000 feet (3048M)
Physical Dimensions	18.0 in. (45.72 cm) High X 18.9 in. (48.0 cm) Wide X 25.38 in. (64.51 cm) Deep
Weight	50 pounds (22.67 Kg)
CRT Screen Size	15 inches (30.5 cm) diagonally
Display Format	80 characters per line x 25 lines; 8 pages, maximum
Character Set	128 ASCII characters (with 32 control characters); upper/lower case fonts; 9 x 11 dot matrix pattern
Refresh Rate	50/60 Hertz (depending upon line frequency)
Cursor:	
Format	Reverse video rectangle (10 x 12 dot matrix)

Table 1-1. ADM-42 Specifications (cont'd)

SPECIFICATIONS	DESCRIPTION
Control	Left (←); Right (→); Up (↑); Down (↓); HOME; LINE FEED; NEW LINE; RETURN; TAB; BACK TAB; position addressing/reading
Keyboard:	
Construction	Solid state logic; similar to typewriter layout; numeric/ cursor/function/send key pads
Key Assignment	Data and Special Character 60 Cursor and Format 19 Special Function 16 Terminal Control 5
Communications:	
Standard Interface	EIA RS-232-C, 20-ma current loop, extension
Optional Interfaces	Serial/parallel printer; synchronous; polling
Data Transmission Rates	50, 75, 110, 134.5, 150, 300, 600, 1,200, 1,800, 2,000, 2,400, 3,600, 4,800, 7,200, 9,600 baud
Transmission Modes	Block Mode; Conversation Mode, Half Duplex; Conversation Mode, Full Duplex
Code for Transmission	Asynchronous or synchronous ASCII
10-Bit Word Format	(1) 7 data bits; odd/even parity; START bit, 1 STOP bit (2) 8 data bits; START bit; 1 STOP bit
11-Bit Word Format	(1) 7 data bits; START bit; odd/even parity; 2 STOP bits (2) 8 data bits; START bit; odd/even parity; 1 STOP bit

Block Mode

In the Block Mode, information is transmitted and received as complete messages or blocks of data (compared with character-by-character operation in the Conversation Mode). The characters are stored and displayed, but are not automatically transmitted. The operator or the computer enters the complete message, up to two full pages in length. After the message has been completed, the operator can edit the information. The operator may send the message line by line (SEND LINE) or by the page (SEND PAGE), as well as the complete message (SEND MSG). If desired, the operator may select only part of the information for transmission. This is done by inserting control characters in the copy during the editing phase. These control characters signal the start of message and the end of message. Then when the SEND MESSAGE COMMAND is issued, only the copy between the control characters is transmitted.

The Block Mode, besides providing the edit capability, also permits faster transmission of large blocks of data than can be obtained in the Conversation Mode. It also permits more efficient utilization of the remote computer and data transmission lines. The ADM-42 can operate off-line when the information is being typed and edited, and come on-line only during the actual transmission. Then too, the baud rate can be increased, which results in a reduction of computer time (to receive the information), as compared to having the operator send the same message in the Conversation Mode.

Conversation Mode, Half-Duplex

In this mode, the ADM-42 can send and receive information to and from the remote computer, but in only one direction at a time. Characters are displayed, and simultaneously transmitted, one character-at-a-time as they are typed at the keyboard. Received characters are displayed as they are received.

Conversation Mode, Full-Duplex

The ADM-42 can transmit and receive information in both directions simultaneously in full-duplex operation. Characters are transmitted as they are typed, but are displayed only on reception. In order for transmitted characters to be displayed in full-duplex operation, they must be echoed from the remote computer back to the ADM-42.

1.5.2 Character Format

The standard ADM-42 character set contains 128 ASCII characters, 32 of which are control characters that require special key operations to produce from the keyboard. (See figure 1-3) The entire character set can be displayed on the CRT screen if transmission from computer or keyboard is preceded a command placing the terminal in Program Mode.

1.5.3 Word Structure

The ADM-42 can transmit and receive data characters in any one of the asynchronous character formats shown in figure 1-4. These word format codes are selected by means of DIP switches located internal to the ADM-42.

1.5.4 Configuration Control

Three sets (banks) of DIP switches are provided on the standard PCBA which can be used to establish or change certain operational characteristics of the ADM-42. Figure 1-5 shows the location of these switches, whose functions are described below.

Switch Location 1B

There are four active switches at location 1B:

- SW 1 determines the characteristics of the video field designated by a video attribute control code: ON causes the field to be blank or underline, depending upon which control code was selected; OFF causes the field to be underlined.
- SW 2 determines how the selected video attribute control codes will be displayed on the CRT: ON causes the codes to be displayed as codes; OFF causes the codes to be displayed as spaces.
- SW 3 controls the Graphic Mode attribute (future).
- SW 4 determines whether ADM-42 null codes will be displayed as null codes (ON) or space codes (OFF).

Switch Location 15M

There are seven active switches at location 15B:

- SW 1 controls the operation of the keyboard BREAK key: OFF disables the key; ON enables the key.
- SW 2 controls the monitor refresh rate: OFF for 60 Hz line frequency; ON for 50 Hz frequency.

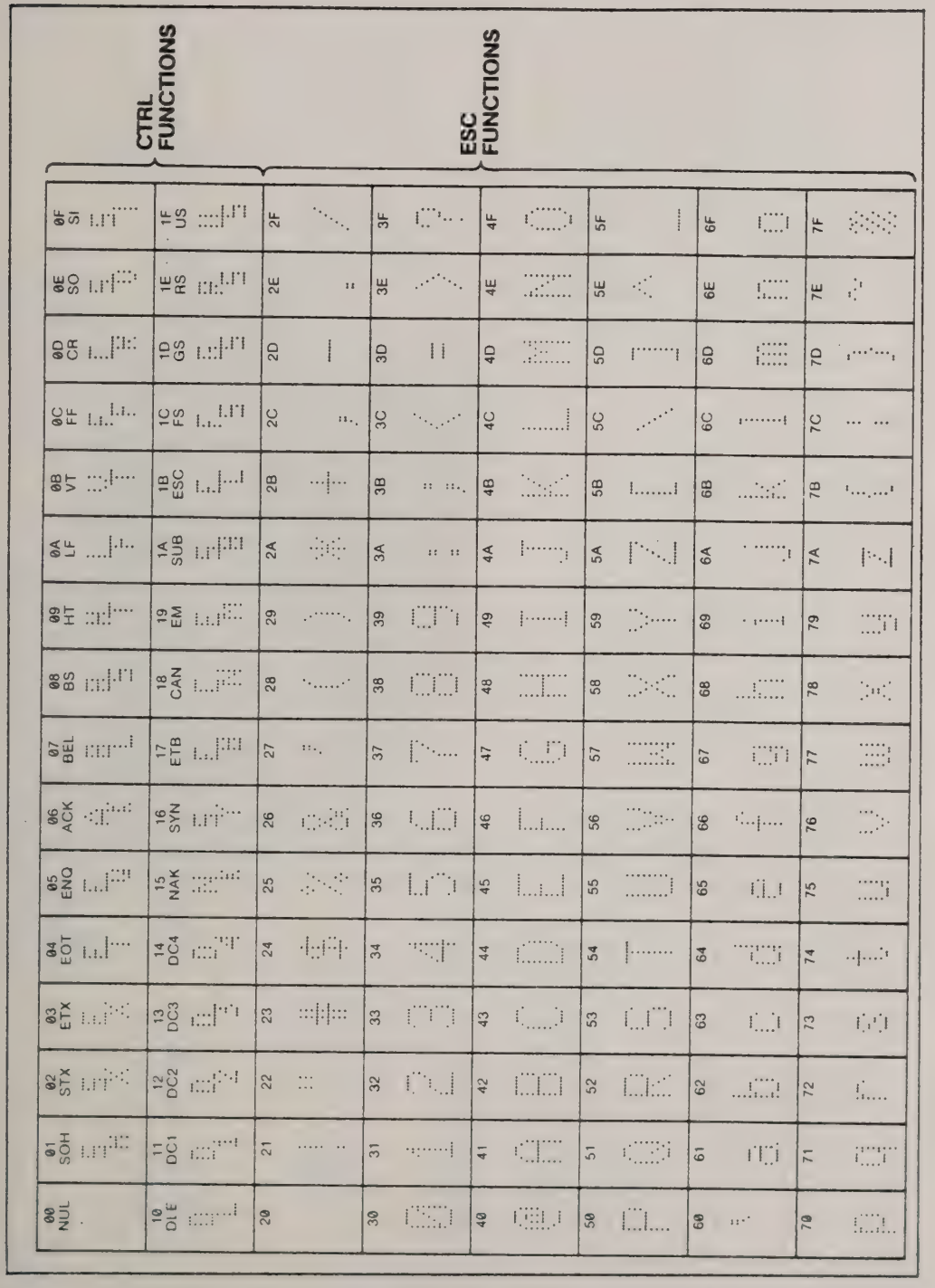


Figure 1-3. ADM-42 Character Format (By Ascending ASCII Codes) With HEX Code

WORD FORMAT	DIP SWITCH CONFIGURATIONS			WORD STRUCTURE										
	SW5	SW4	SW3	BIT Ø	BIT 1	BIT 2	BIT 3	BIT 4	BIT 5	BIT 6	BIT 7	BIT 8	BIT 9	BIT 1Ø
Eleven-Bit Word with Even Parity and 2 STOP Bits	ON	ON	ON	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							even parity	stop	stop
Eleven-Bit Word with Odd Parity and 2 STOP Bits	ON	ON	OFF	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							odd parity	stop	stop
Ten-Bit Word with Even Parity and 1 STOP Bit	ON	OFF	ON	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							even parity	stop	
Ten-Bit Word with Odd Parity and 2 STOP Bits	ON	OFF	OFF	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							odd parity	stop	
Eleven-Bit Word with No Parity and 2 STOP Bits	OFF	ON	ON	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							always Ø	stop	stop
Ten-Bit Word with No Parity and 1 STOP Bit	OFF	ON	OFF	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							always Ø	stop	
Eleven-Bit Word with Even Parity and 1 STOP Bit	OFF	OFF	ON	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							always 0	even parity	stop
Eleven-Bit Word with Odd Parity and 1 STOP BIT	OFF	OFF	OFF	$S_{t_{a_{r_t}}}$	ACTIVE BITS = 1 OR Ø							always 0	odd parity	stop

Figure 1-4. Word Format Codes With DIP Switch Configurations

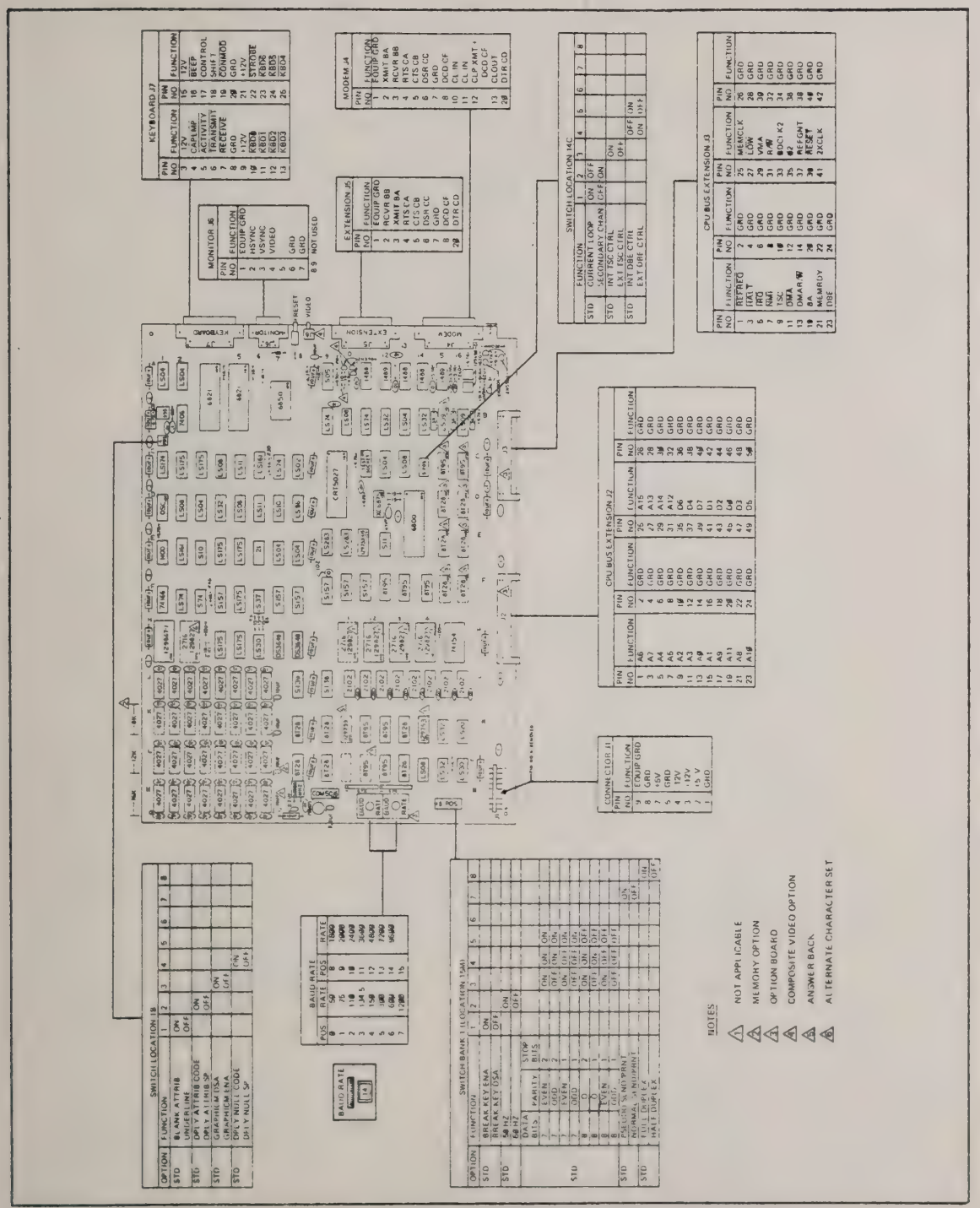


Figure 1-5. Standard PCBA Component and Interface Connector Locations

- SW 3, 4, 5 control the MODEM interface word structure, in accordance with the settings shown in figure 1-4.

- SW 7 ON enables Pseudo Print control; OFF enables Normal Print control.

- SW 8 ON establishes CONV MODE Full Duplex operation; OFF establishes Half Duplex operation. Either setting may be dynamically changed by an escape sequence.

Switch Location 14C

There are five active switches at location 14C:

- SW 1 and SW 2 control the current/loop/secondary channel interface, as follows:

  SW 1 ON and SW 2 OFF = Current loop enabled

  SW 1 OFF and SW 2 ON = Secondary Channel enabled

  SW 1 and SW 2 OFF = Current loop and Secondary channel disabled

- SW 3 ON enables internal TSC (Tri state bus control); SW 3 OFF enables external TSC.

- SW 4 and SW 5 control the operation of the data bus extension (DBE) logic, as follows:

  SW 4 ON and SW 5 OFF = External DBE control

  SW 4 OFF and SW 5 ON = Internal DBE control

  SW 4 and SW 5 OFF = Not defined

1.6 ADM-42 OPTIONS

The ADM-42 can be provided with a large number of independently controlled and executed optional features, each requiring additions and/or alterations to the standard PCBA. (See figure 1-6). The following options are available.

Option No. 1

Not applicable

Option No. 2 - Data RAM Extension

This option provides the capability of extending the basic RAM in the CPU an additional 8K, 12K, or 16K by the installation of the appropriate number of 4K RAM chips.

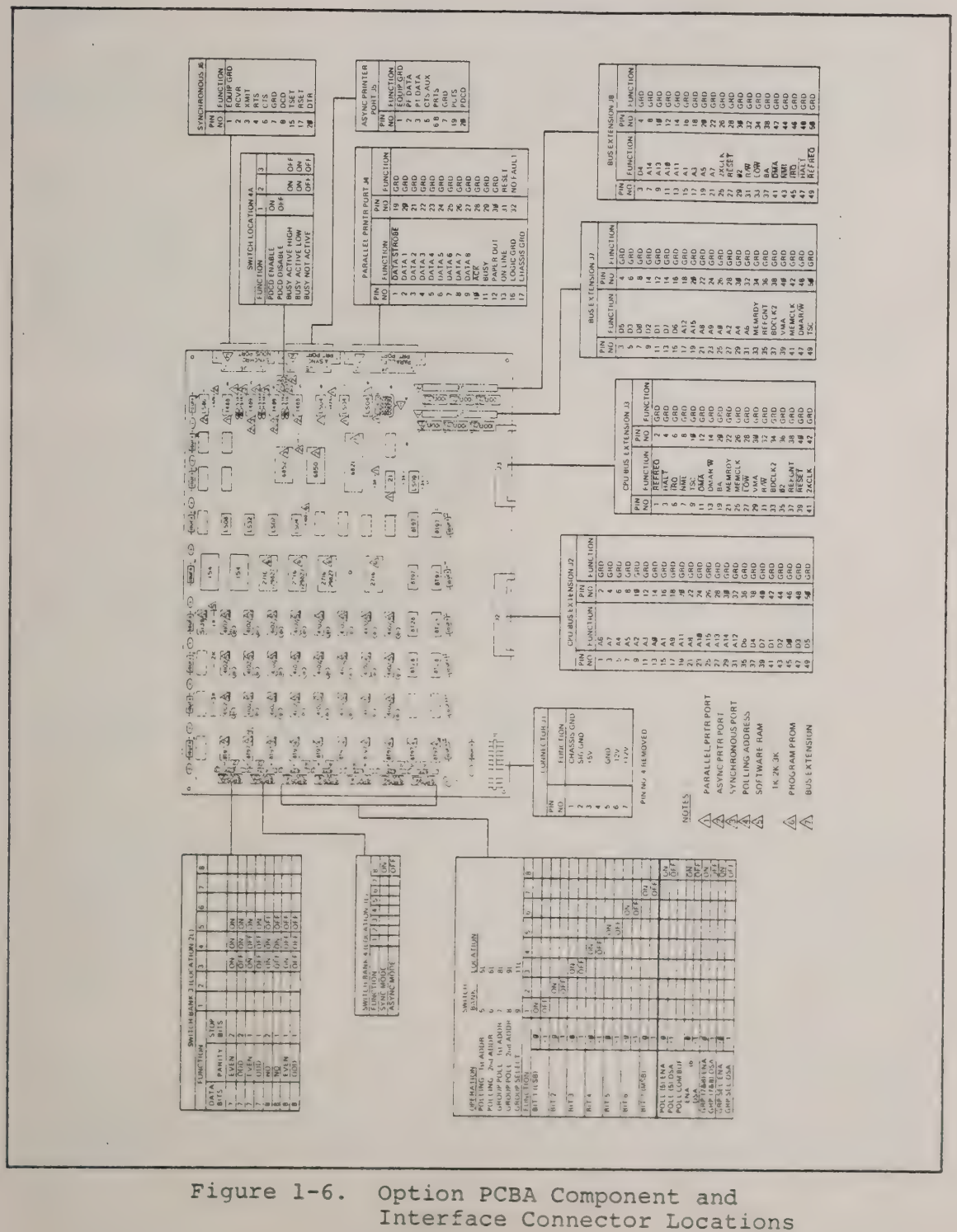


Figure 1-6. Option PCBA Component and Interface Connector Locations

Option No. 3 - Option Board Installation

This option basically is the installation of an option PCBA in addition to the standard PCBA in the ADM-42. Once installed, along with the appropriate hardware required to interconnect the various logical bus extensions, several other sub-options are available, as follows:

- Parallel Printer Port option provides the appropriate logic and hardware for connecting a parallel printer. Included in this option is the ability to program the port so that the printer connected to the port may be controlled directly from the host computer without otherwise affecting ADM-42 operation.

- Asynchronous Serial Printer Port option provides the same capabilities as the parallel port option, except that a serial printer may be connected.

- Synchronous Port option provides the appropriate logic and hardware for the connection of a data set (such as a Bell System Data Set) or teletypewriter to the ADM-42.

- Polling Address option provides the appropriate logic and hardware to accommodate the following polling modes: Select, Group Poll, Sequential Select, Group Select, Fast Select, Broadcast Select, and Multi-Point Contention.

- Programmable Function Keys option provides the ability to store either 32 or 64 characters under any function key F1 through F16, shifted or unshifted.

Option No. 4 - Composite Video

The composite video option converts the CRT's video and sync signals into a composite video output which is then routed to the rear-panel COMPOSITE VIDEO output connector. Data can then be transmitted to a compatible composite video monitor located up to 1000 feet away, through a single coaxial cable. The ADM-42 can function in its normal capacity at the same time it is serving as a control terminal for a remote monitor.

Option No. 5 - Answer Back Option (Future)

The automatic answer back option provides terminal identification and allows the ADM-42 to respond to an ENQ input from the computer with the answer back message. The answer back message will be displayed as it is being transmitted, if the terminal is in Conversation Mode, Half Duplex.

Option No. 6 - Optional Character Generator Set

This option, when combined with optional keyboard arrangements makes it possible to display and print data in many different fonts and languages. Languages which are currently available include German, United Kingdom, and Scandanavian.

Option No. 10 - 230V 50 Hz Power Input

Standard input power for the ADM-42 is 115 volts ac at 60 Hz. 230 Vac power at 50 Hz is readily accommodated by changing the power supply transformer, the monitor supply transformer, and the main logic board connections. Internal DIP switches establish the video refresh rate at 50 or 60 Hz, depending upon line frequency.

1.7 RELATED DOCUMENT

ADM-42 Maintenance Manual DP 309

SECTION 2

INSTALLATION

2.1 INTRODUCTION

Installation procedures involving unpacking, initial set-up, and operational checkout of the ADM-42 Data Display Terminal are described in this section of the manual. In addition, the several interface modes of installation are described in detail.

2.2 SAFETY REQUIREMENTS

No special safety precautions are required for ADM-42 installation.

2.3 SITE REQUIREMENTS

The ADM-42 Data Display Terminal may conveniently be used in a normal office environment, as no special mounting provisions are required. However, it is recommended that a weather protected environment with an ambient temperature range of 41°F to 122°F (5°C to 50°C), relative humidity not greater than 95% be maintained for equipment use.

Whenever the ADM-42 is physically moved from a cold location to a warmer environment, be sure to allow sufficient time for the equipment temperature to equalize with the warmer location before activating the terminal. Condensation developed by the temperature differential could possibly impair ADM-42 operation.

CAUTION

Allow warm up of unit when changing locations from one room to another, because condensation may develop in the unit, which may effect the operation of the device.

The physical dimensions of the ADM-42 are given in Section 1, along with installation power and environmental parameters. The basic requirements for installation are the following:

- Table or desk for mounting
- Standard three-pronged 115-volt (230-volt) power outlet
- Data signal interface connection to the computer, modem, serial printer, or other auxiliary device. If connection to a remote computer is desired, a modem or data set is required.

2.4 UNPACKING AND INITIAL INSPECTION

Each ADM-42 unit is packed using standard practices for the shipping of electronic equipment. Every precaution is taken to ensure that each unit is complete and ready for installation at the customer site. However, it is recommended that each unit be inspected upon receipt for transit damage. Inspect for exterior evidence of damage. Contact the carrier and LSI immediately if damage is evident, specifying the nature and extend of the damage (if known).

If there is no apparent shipping damage, open the shipping carton and remove the items, checking them against the shipping list to verify the contents of the carton. Contact LSI immediately in the event of a packing shortage. Check to verify that the serial number of the unit corresponds to that shown on the invoice. Visually inspect the exterior of the enclosure for evidence of physical damage which may have occurred in shipment.

Check the hardware to determine if any assemblies or screws have been loosened during shipment. Tighten as required. Inspect for dust or foreign material which may impair electrical contact when cable connections are made. Vacuum to remove any loose dirt. Remove the bubble packing from the interior of the terminal.

2.5 INITIAL PREPARATION

2.5.1 Line Voltage Selection

The ADM-42 is shipped connected for either 115-volt or 230-volt operation, as specified in the purchase order. Any change in line voltage requires circuit changes in the ADM-42 which can be accomplished only by authorized LSI maintenance personnel.

2.5.2 Configuration Control Switch Settings

A number of internal DIP switch banks are provided for encoding selected system configuration characteristics. The locations of these switch banks and their functions are shown in the component and interface connections illustrations for the standard and option PCBA's in Section 1.

2.6 INTERFACE INFORMATION, STANDARD PCBA

The ADM-42 using the standard PCBA may be cabled directly to a local computer or other auxiliary device; or it may be connected via telephone data lines to a remote computer located anywhere in the world. Remote computer connections require the use of a modem or data set. Figure 2-1 shows several typical ADM-42 interfaces, while figure 2-2 shows the ADM-42 interface logic associated with the interfaces.

2.6.1 MODEM Port Interface

The MODEM port interface is used to connect the terminal directly to a computer, modem or data set, or to a computer or device in a current-loop application.

2.6.2 EXTENSION Port Interface

The EXTENSION port interface enhances the standard RS-232-C capabilities of the ADM-42 to permit daisychaining of several terminals or other auxiliary devices.

2.7 INTERFACE INFORMATION, OPTION PCBA

The ADM-42, using the option PCBA in addition to the standard PCBA, may be cabled directly to an asynchronous serial or parallel printer; or to a synchronous device. Whenever these devices are used, bus extension connections must be made between the option PCBA and the standard PCBA, as well as to the remote computer. (See figure 2-3 for bus extension connections.)

2.7.1 PARALLEL PRINTER Port Interface

The PARALLEL PRINTER interface is used to connect the ADM-42 directly to parallel printer. Figure 2-4 shows the option PCBA logic associated with this interface.

2.7.2 ASYNCHRONOUS PRINTER Port Interface

The ASYNCHRONOUS PRINTER interface is used to connect the ADM-42 directly to an asynchronous serial printer. Figure 2-5 shows the option PCBA logic associated with this interface.

2.7.3 SYNCHRONOUS Port Interface

The SYNCHRONOUS interface is used to connect the ADM-42 directly to a synchronous device such as a Bell System Data Set. Figure 2-6 shows the option PCBA logic associated with this interface.

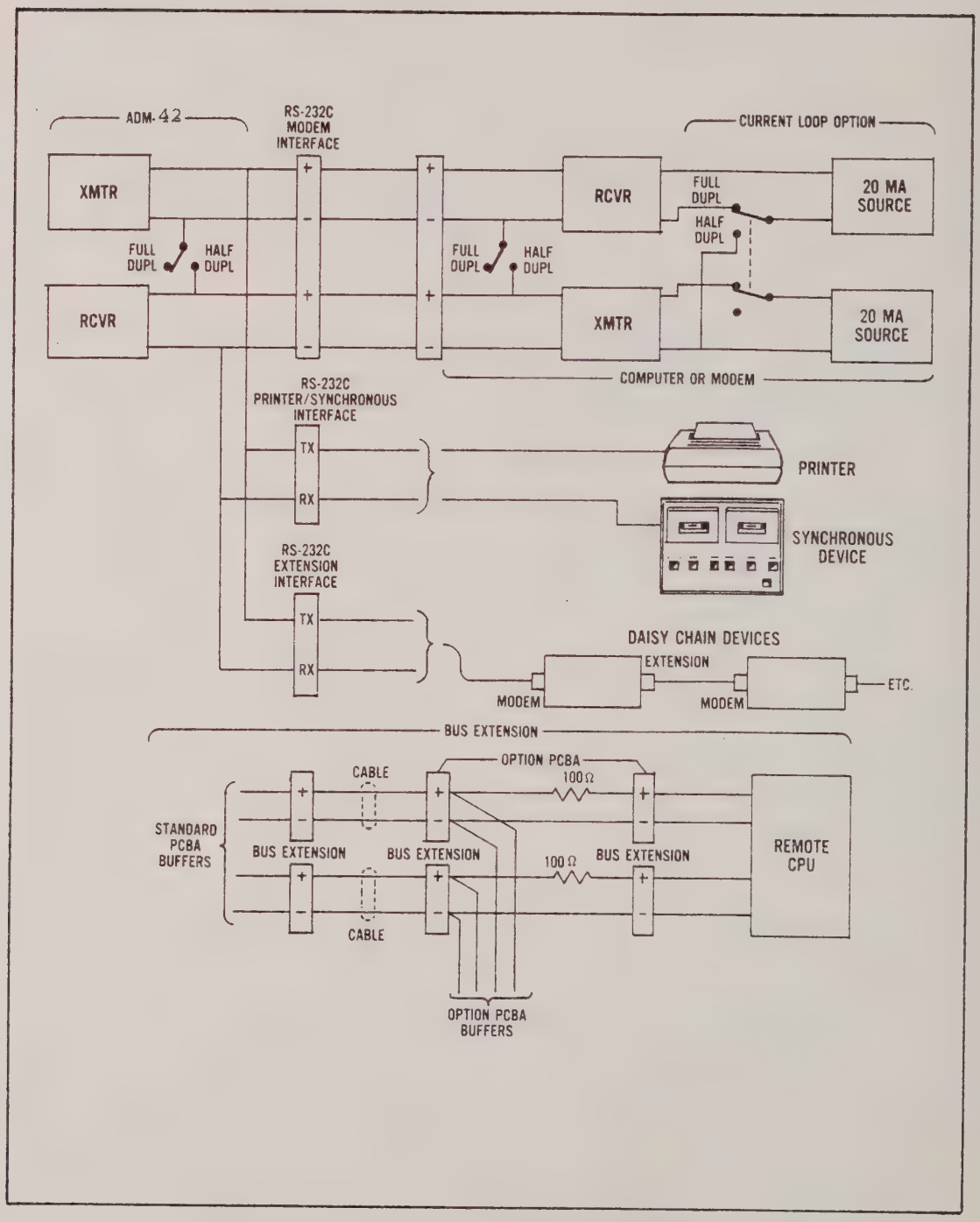


Figure 2-1. Typical ADM-42 Interfaces

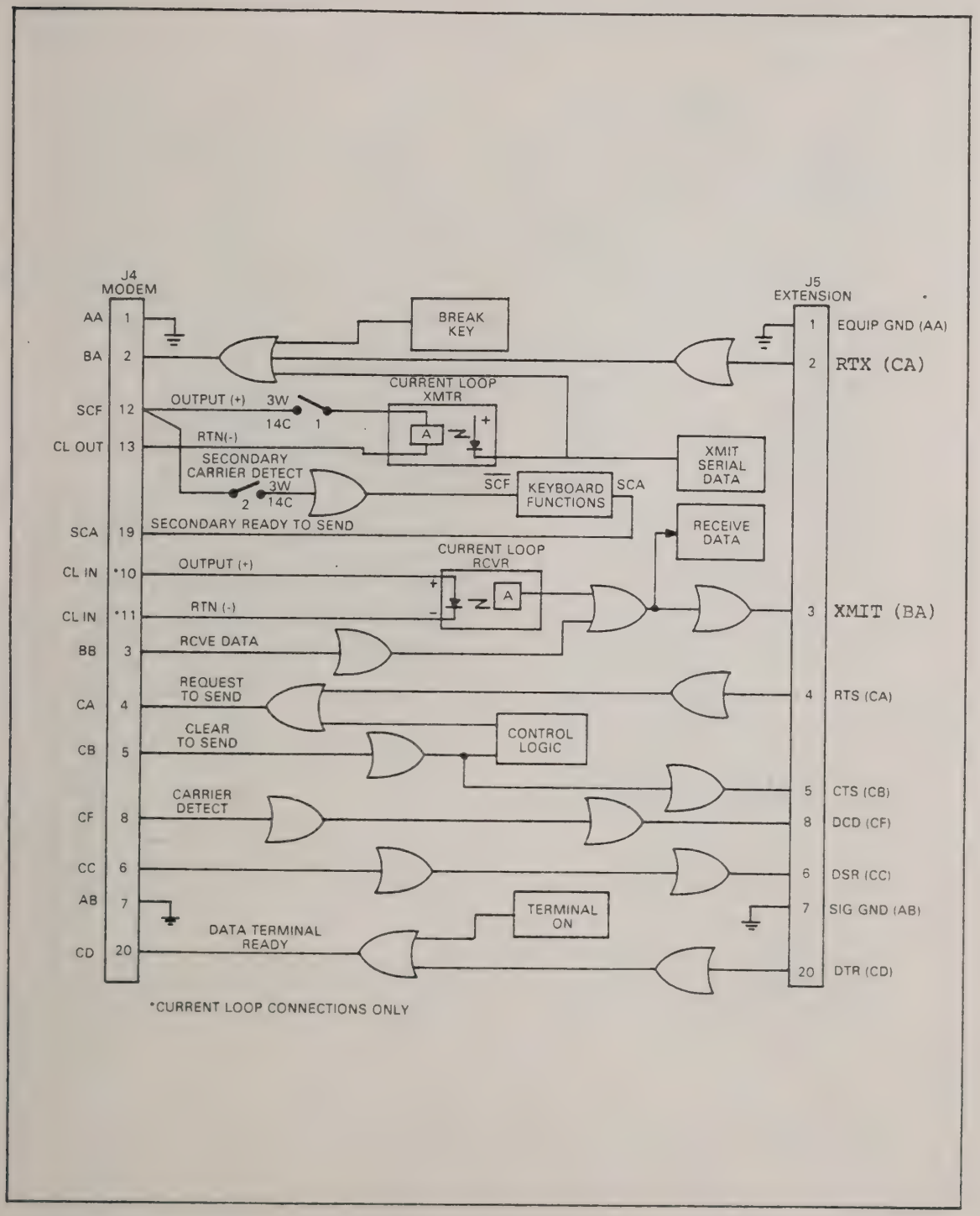


Figure 2-2. ADM-42 Standard PCBA Interface Logic

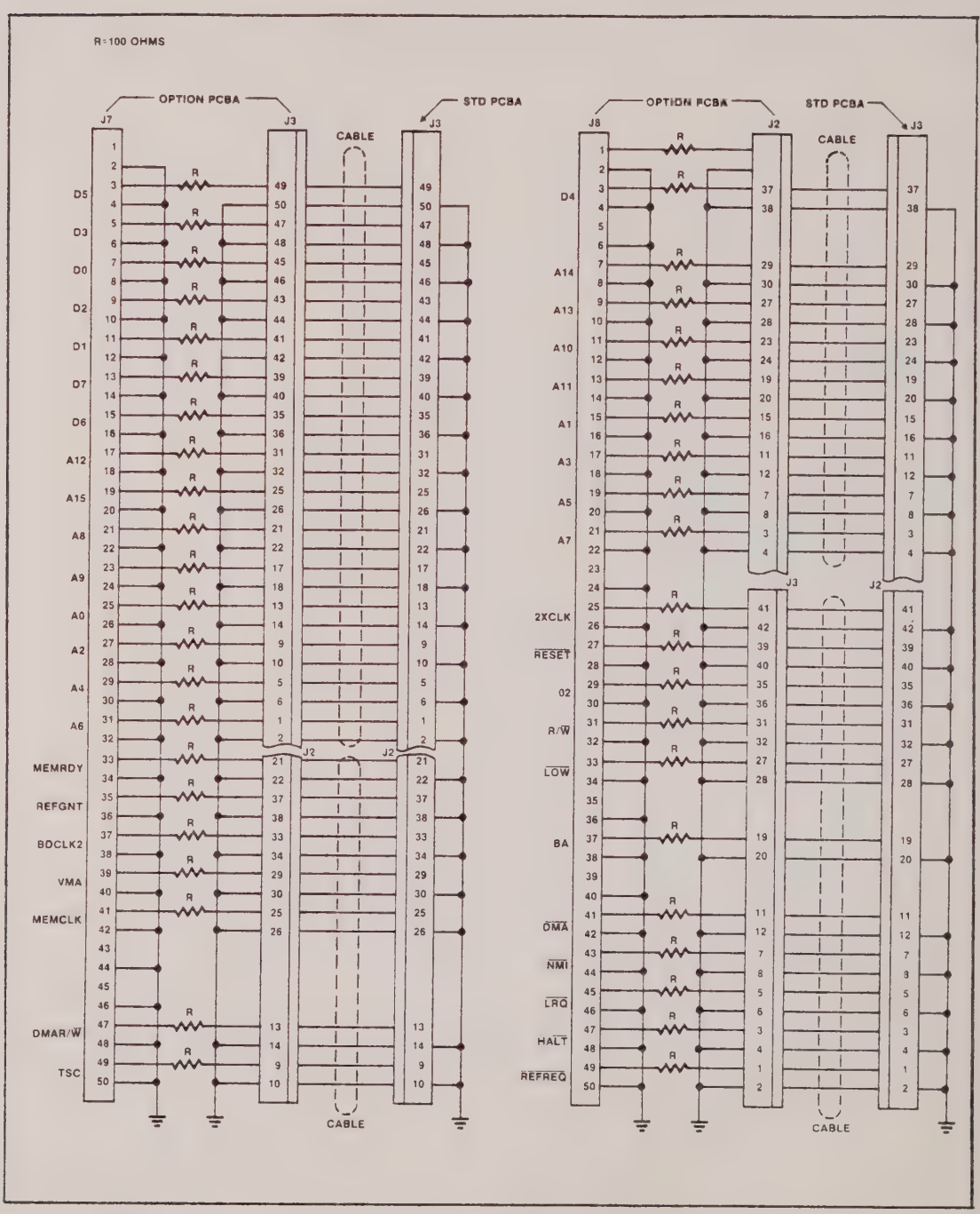


Figure 2-3. Option PCBA CPU Bus Extension Interface Connector/Pin List

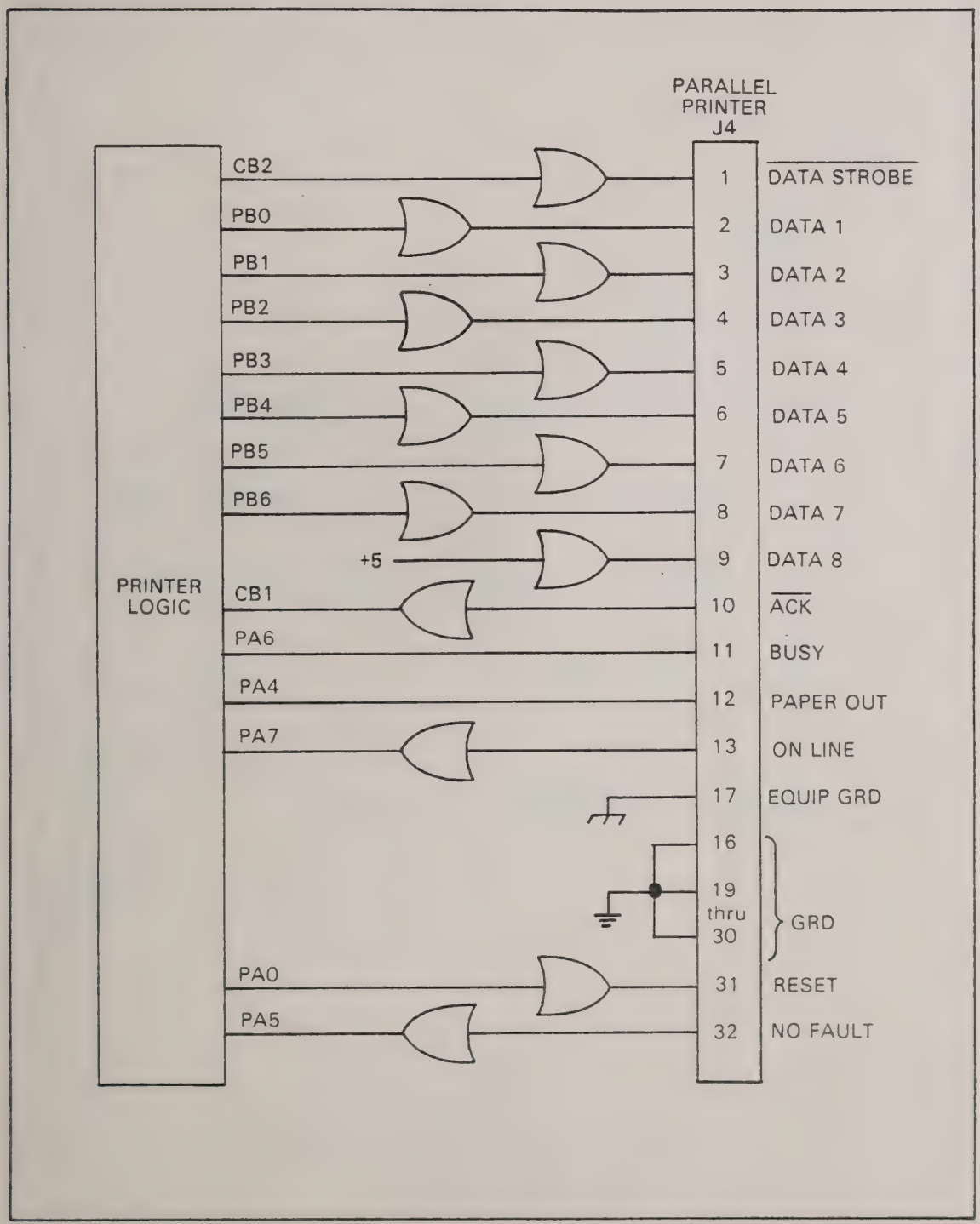


Figure 2-4. Option PCBA Parallel Printer Port Interface Logic

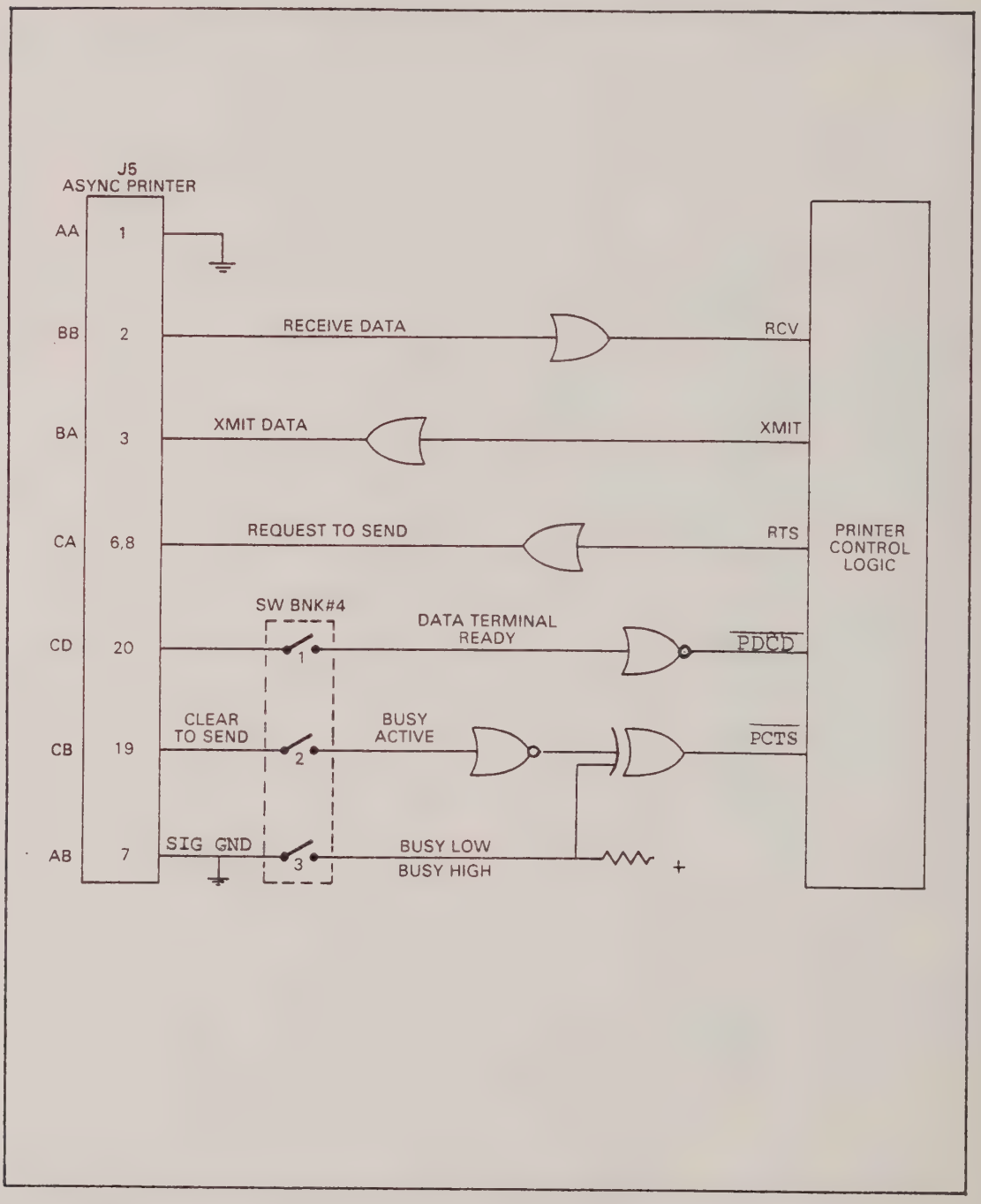


Figure 2-5. Option PCBA Asynchronous Serial Printer Port Interface Logic

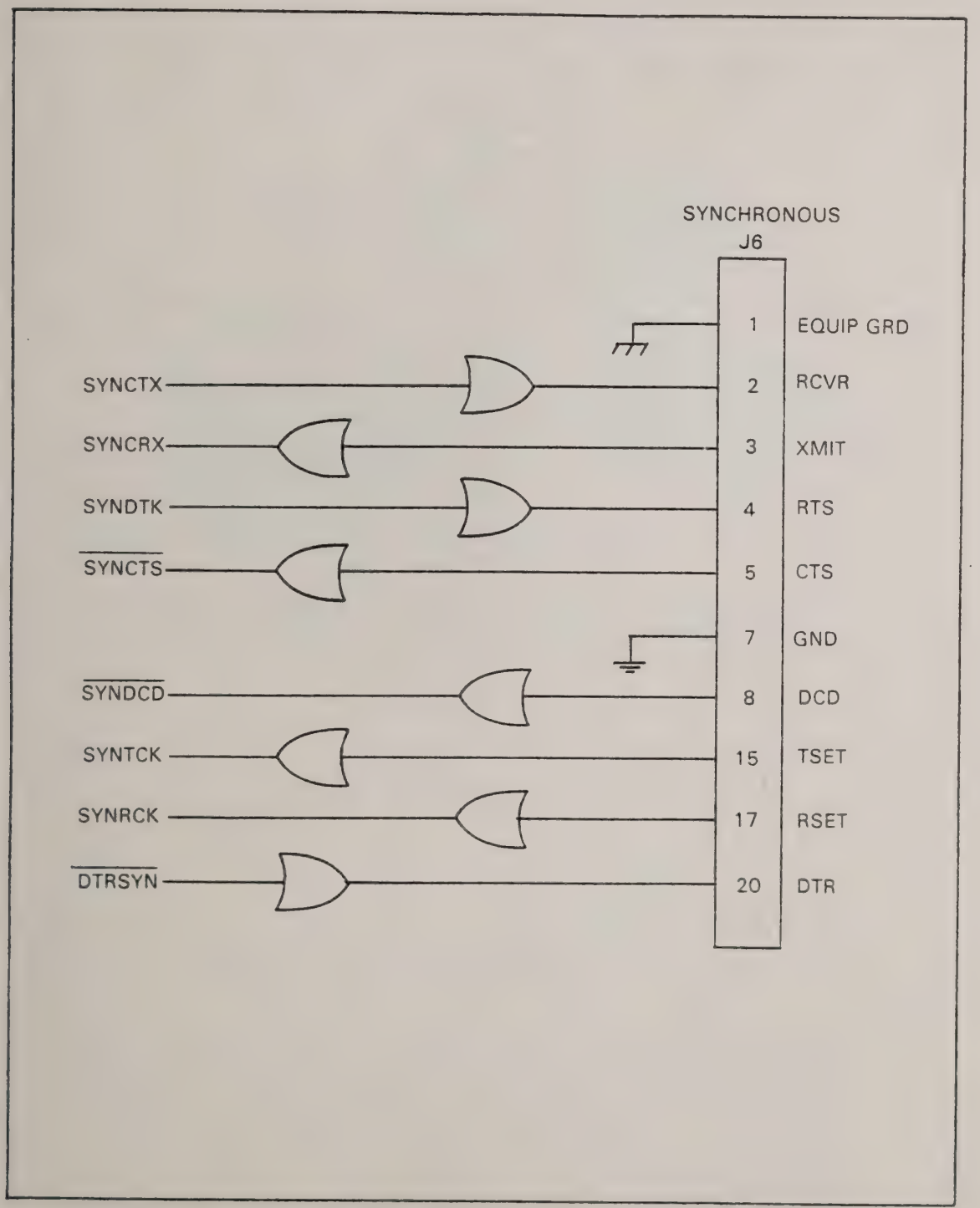


Figure 2-6. Option PCBA Synchronous Port Interface Logic

2.8 INSTALLING THE ADM-42

To install the ADM-42, proceed as follows:

CAUTION

Be sure the bubble packing has been removed from the interior of the electronics unit. Damage to the equipment may result if not removed.

1. Connect the data interface cable to the terminal using the appropriate interface information.

2. Check the ON/OFF switch to ensure it is in the OFF position. Refer to figure 2-7 and table 2-1 for rear panel control information.

3. Plug the terminal into a grounded AC outlet of the proper voltage.

4. Set the appropriate BAUD RATE switch (refer to table 2-1) to the desired baud rate.

5. Set the configuration control switches (see Section 1 illustrations) to the positions required to control the desired terminal characteristics.

6. Proceed to turn on the terminal.

2.9 TURN-ON AND TURN-OFF PROCEDURES

Turn-on of the ADM-42 is accomplished by complying with the following steps:

1. Set the ON/OFF switch to the ON position.

2. Note that in approximately 20 seconds after power turn-on, the cursor appears at the HOME position, and the rest of the screen is clear.

3. If the cursor does not appear after the warm-up period, momentarily press the HOME key. If this fails to produce the cursor, it is possible that the BRIGHTNESS and/or the CONTRAST controls are misadjusted. If this condition exists, slide the CONTRAST control until the background is barely visible. The cursor should be present.

4. If cursor still does not appear, press the CONV MODE key and verify that the key lights up. If so, troubleshoot the CRT monitor; if not, troubleshoot the terminal electronics.

Note

If data is not entered into video from the keyboard or remote device within approximately 15 minutes after terminal turn-on, video will shut down. Restore video by entering any character into video.

Turn-off of the ADM-42 is accomplished as follows:

If the terminal contains information that must be retained, be sure to transmit this information immediately to the remote computer. This is necessary as the display memory is cleared when the AC power switch is set to ON. As an alternate measure, print the information prior to turning off the terminal.

Turn-off the ADM-42 by setting the AC power switch to OFF.

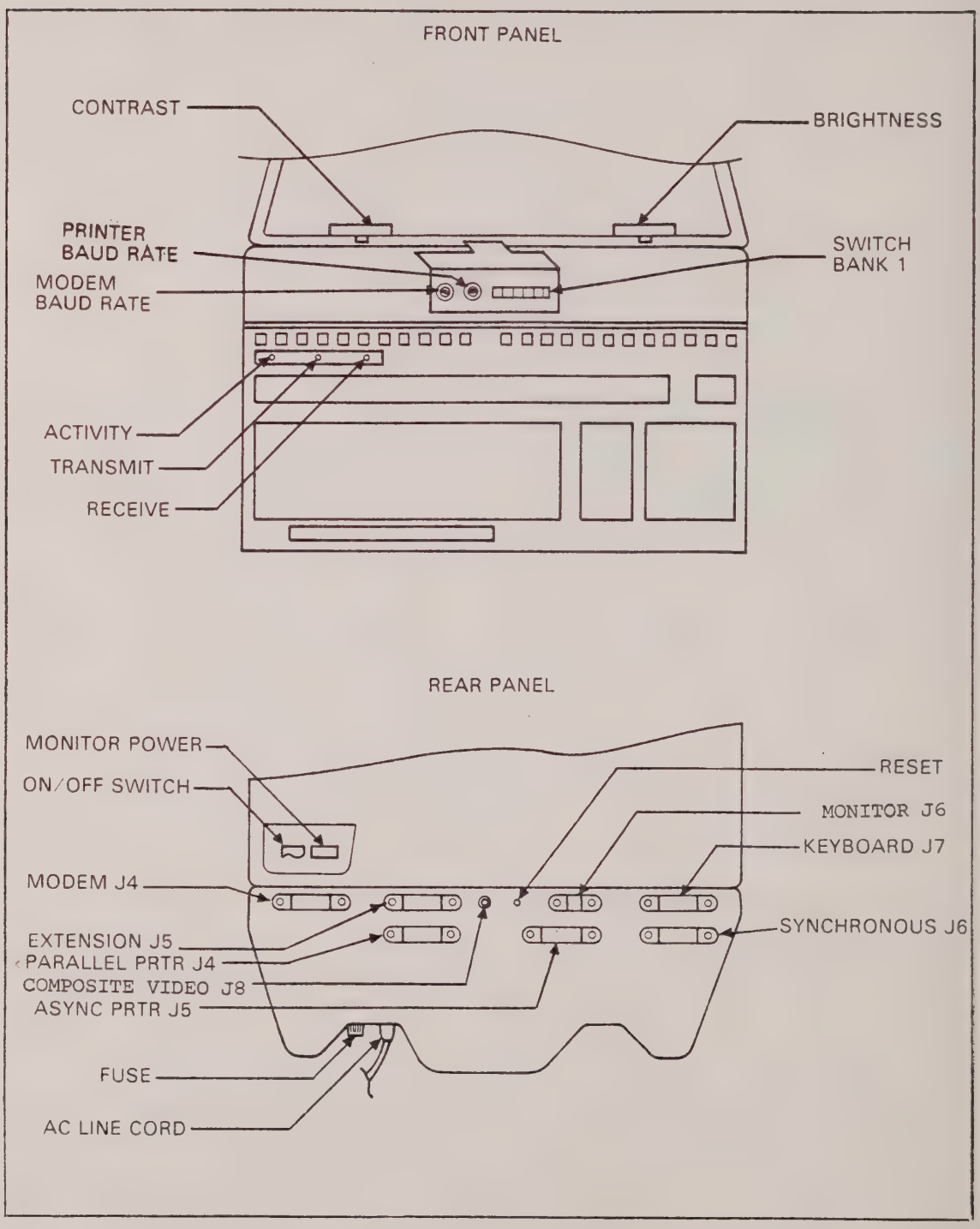


Figure 2-7. Location of ADM-42 Controls and Interface Connectors

Table 2-1. ADM-42 Controls and Interface Connectors

NAME	OPERATIONAL DESCRIPTION
	FRONT PANEL
CONTRAST Control	Slide potentiometer controls the character brightness relative to the background. Contrast is usually adjusted after brightness is established.
BRIGHTNESS Control	Slide potentiometer controls the overall brightness of the CRT display. Brightness is usually adjusted so that the display raster (background) is barely visible or just below the point of visibility.
SWITCH BANK 1 (Location 15M)	Bank of eight two-position switches controls ADM-42 characteristics as follows: SW 1 — BREAK Key Enable/Disable SW 2 — Refresh Rate = 50/60 Hz SW 3,4,5 — Word Format SW 6 — Not Used SW 7 — Send Print Pseudo/Normal SW 8 — Full/Half Duplex
RECEIVE Indicator	Lights when terminal is receiving data.
TRANSMIT Indicator	Lights when terminal is transmitting data.
ACTIVITY Indicator	Lights when keyboard is active.
PRINTER BAUD RATE and MODEM BAUD RATE Switches	16-position rotary switches control MODEM Port and PRINTER Port baud rates, as follows: POS. RATE POS. RATE 0 50 8 1,800 1 75 9 2,000 2 110 10 2,400 3 134.5 11 3,600 4 150 12 4,800 5 300 13 7,200 6 600 14 9,600 7 1,200 15 N/A

Table 2-1. ADM-42 Controls and Interface Connectors (cont'd)

NAME	OPERATIONAL DESCRIPTION
	REAR PANEL
ON-OFF Power Switch	This two position switch controls the AC power to the unit and certain power-up and power-down sequences. Setting the switch to the ON position resets the circuitry within the ADM-42, positions the cursor to home, and clears the display memory to unprotected nulls.
Monitor Power Connector	Three conductor AC cable for supplying power to the CRT monitor.
RESET Switch	Spring return push switch performs the same function as power up restart. NOTE: Any data in memory or on the screen will be erased.
MONITOR J6	Interface connector between the terminal logic circuits and the CRT monitor (which may be moved to a remote location).
KEYBOARD J7	Interface connector between the terminal logic circuits and the keyboard (which may be moved to a remote location).
SYNCHRONOUS J6 (Option PCBA)	Interface connector for synchronous device (data set, TTY, etc.) option; enabled and disabled by ADM-42 logic.
AC Line Cord	Three conductor AC cable for supplying power to the ADM-42.
FUSE	AC line fuse (3A for 115V; 1.5A for 230V).
ASYNC PRNTR J5 (Option PCBA)	Interface connector for serial printer option; enabled and disabled by ADM-42 logic.

Table 2-1. ADM-42 Controls and Interface Connectors (cont'd)

NAME	OPERATIONAL DESCRIPTION
	REAR PANEL
COMPOSITE VIDEO J8	Composite video output connector; provides capability of driving a remote video monitor up to 1,000 feet from the terminal.
PARALLEL PRNTR J4 (Option PCBA)	Interface connector for parallel printer option; enabled and disabled by ADM-42 logic.
EXTENSION J5	This bidirectional interface operates at RS-232C logic levels and allows daisychaining additional ADM-42 terminals and connection of a serial EIA auxiliary device such as a printer to the terminal. A 25 pin connector (AMP #205208-1 or equivalent) is used for attaching auxiliary devices.
MODEM J4	This is the main I/O port which outputs data to and inputs data from the remote data source. The main I/O operates at RS-232C logic levels. Some pins are used for the current loop interface.

SECTION 3

OPERATING INSTRUCTIONS

3.1 INTRODUCTION

The purpose of this section is to describe how to use the ADM-42 Data Display Terminal. The terminal is used to enter, display, and send information to a remote computer or modem, printer, terminal or other auxiliary device, and to receive and display information from the computer or modem.

3.2 KEYBOARD FUNCTIONS

The operator uses a keyboard that resembles the keyboard of a conventional typewriter to enter data. Information typed by the operator may be displayed on a cathode ray tube (CRT) immediately, as during full-duplex operation. All or part of the display can be changed by the operator (text editing), or from the remote computer. This allows updating of information and quick, clean corrections of typing errors.

Figure 3-1 shows the keyboard layout of a standard ADM-42 Data Display Terminal. Many of the keys control several operations, depending on how they are used in combination with other keys on the terminal. Table 3-1, in conjunction with the paragraphs which follow, list and describe in detail operator keyboard operations. Those special operations beyond those associated with conventional typewriter key operations are described in detail under Programming Considerations in this section.

Except for a number of special operation keys, the keyboard is equipped with key roll-over protection (i.e., each key which is pressed must be released before the next key code can be produced).

The keyboard contains the following functional keys:

- Terminal control keys
- Lower and upper case alpha characters

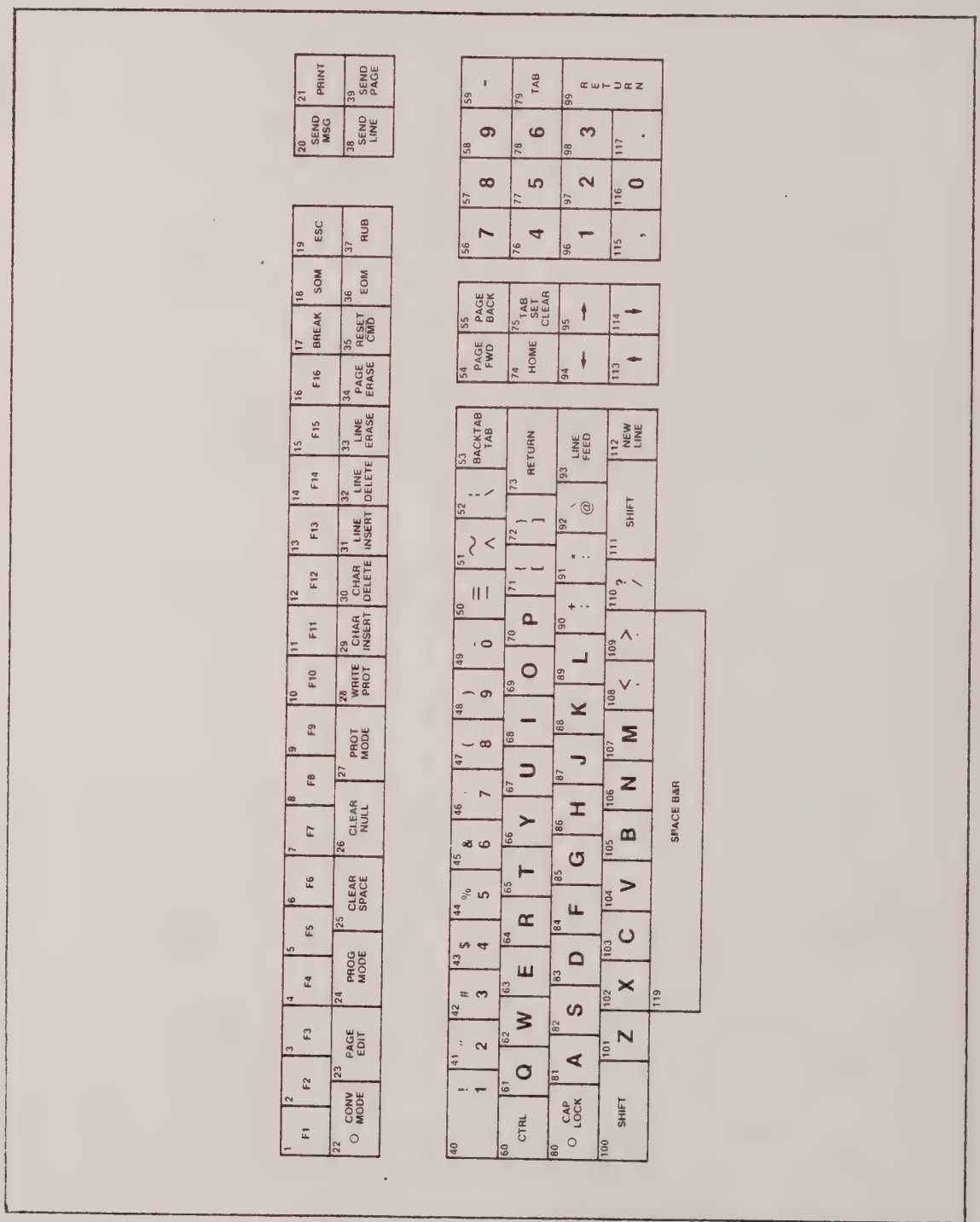


Figure 3-1. ADM-42 Data Display Terminal Standard Keyboard

- Numeric characters on main and auxiliary keyboards
- Numeric characters with SHIFT (main keyboard only)
- Special characters
- Special characters with SHIFT
- Operational control keys
- Operational control keys with SHIFT
- Function keys F1 through F16
- Function keys F1 through F16 with SHIFT

3.2.1 Terminal Control Keys

The SHIFT key is similar to the shift key of a conventional typewriter (refer to table 3-1, item 7). The key is used to produce shifted ASCII codes associated with upper case alpha characters (A to Z) and with the upper symbols of keys capable of producing two different symbols. No character is produced when the SHIFT key is operated. When used in conjunction with special operation keys (ESC, CLEAR SPACE, etc.) the SHIFT key causes shifted ASCII codes to be produced, thus giving rise to alternate functions.

The RESET keys reset a keyboard LOCK condition. In a polling environment, the operation returns the terminal to non-polling operation. When RESET is pressed while CTRL is depressed, a firmware RESET is performed which clears all dynamic modes and protected fields.

Note

The RESET switch at the rear of the terminal causes a hardware RESET, as well as a firmware reset.

The CAP LOCK key allows the operator to type a series of shifted alpha characters (but not shifted numeric or special characters) continuously, without using the SHIFT key. Pressing the CAP LOCK key sets the CAP function and lights a lamp in the key. Pressing CAP LOCK a second time releases the function and extinguishes the lamp. No character is produced when CAP LOCK is pressed.

The space bar produces an ASCII space code to be produced and stored in memory for transmission. A space character (blank) also appears on the CRT display.

Table 3-1. Keyboard Operations

CONTROL	PAR. REF.	FUNCTION
1. Alphabet Keys	3.2.2	Lower case a to z
2. Alphabet, with SHIFT	3.2.2	Upper case A to Z
3. Numeric (Main and Numeric Keyboards)	3.2.2	Numerals 0 to 9
4. Numeric (Main Keyboard) with SHIFT	3.2.2	Special Characters
5. Special Character (Main and Numeric Keyboards)	3.2.3	Special Characters
6. Special Character (Main Keyboard) With SHIFT	3.2.3	Special Characters
7. Terminal Control:	3.2.2	
CAP LOCK		Locks/unlocks keyboard CAP status
SHIFT		Lower/upper case alpha characters; special characters and operations
RESET		Clear frame or parity errors on status Line 25.
CTRL/SHIFT/RESET		Firmware Reset
SPACE BAR		ASCII space code in memory; space character on CRT screen
8. Cursor Control:	3.3	
TAB SHIFT/BACKTAB		Slew cursor to next tab forward/backward (Protect Mode or Typewriter Tab Mode)
HOME		Cursor to HOME position
TAB SET/CLEAR		Set (shifted) tabs

Table 3-1. Keyboard Operations (cont'd)

CONTROL	PAR. REF.	FUNCTION
8. Cursor Control (cont'd):	3.3	
		Increment up, down, left, right
RETURN		Left margin, same line
LINE FEED		Same column, next line
NEW LINE		Left margin, next line
9. Data Editing Control:	3.4	Note: Only the current page is effected.
PAGE EDIT		Set (EDIT in line 25) and reset Page Edit Mode
CLEAR SPACE		Clear unprotected data from screen (memory); replace with unprotected space codes
SHIFT/CLEAR SPACE		Clear all data from screen (memory); replace with unprotected space codes. Resets Protect Mode
CLEAR NULL		Clear unprotected data from screen (memory); replace with null codes
SHIFT/CLEAR NULL		Clear all data from screen (memory); replace with null codes. Resets Protect Mode
CHAR INSERT		Insert character under cursor
CHAR DELETE		Delete character under cursor
LINE INSERT		Insert line following cursor; inhibited in Protect Mode

Table 3-1. Keyboard Operations (cont'd)

CONTROL	PAR. REF.	FUNCTION
9. Data Editing Control (cont'd):	3.4	
LINE DELETE		Delete line containing cursor; inhibited in Protect Mode
LINE ERASE		Erase line from cursor to end of line; replace with spaces
SHIFT/LINE ERASE		Erase line from cursor to end of line; replace with nulls
PAGE ERASE		Erase unprotected characters on page, starting with cursor; replace with spaces
SHIFT/PAGE ERASE		Erase unprotected characters on page, starting with cursor; replace with nulls
PAGE FWD		Shift display (memory) one page forward
PAGE BACK		Shift display (memory) one page backwards
SHIFT/PAGE BACK		Sets AUTO PAGE Mode
10. Data Transmission Control:	3.5	
CONV MODE		Set (lit) Conversation Mode and reset (unlit) to Block Mode
PROG MODE		Set (PROG in Line 25) and reset Program Mode
PROT MODE		Set (PROT in Line 25) and reset Protect Mode

Table 3-1. Keyboard Operations (cont'd)

CONTROL	PAR. REF.	FUNCTION
10. Data Transmission Control (cont'd):	3.5	
WRITE PROT		Set (WPRT in Line 25) and reset Write Protect Mode
BREAK		Send BREAK code to computer
SOM		Cause start of message (STX) code to be formatted on screen
EOM		Cause end of message (ETX) code to be formatted on screen
SEND MSG		Cause all unprotected data bracketed by SOM-EOM codes to be transmitted
SHIFT/SEND MSG		Cause all data bracketed by SOM-EOM codes to be transmitted
PRINT		Send display data to printer in Print Form Format (PRNT in Line 25)
SHIFT/PRINT		Send displayed data to printer in Free Format (PRNT in Line 25)
SEND LINE		Send foreground data from beginning of line to cursor
SHIFT SEND LINE		Send all data from beginning of line to cursor
SEND PAGE		Send foreground data on page thru cursor position
SHIFT/SEND PAGE		Send all data on page thru cursor position

3.2.2 Alphanumeric Keys

The alphanumeric keys (refer to table 3-1, items 1, 2, and 3) are used to write any of the standard ASCII characters shown in ascending ASCII sequence in figure 1-3. Pressing any alpha (A to Z) or numberic (0 to 9) key produces the ASCII 7-bit binary code associated with the unshifted character. When used in conjunction with the SHIFT key, the ASCII code is shifted to that associated with the upper case character on an alpha (A to Z) key and the upper symbol on a double-operation key. Such keys include main keyboard numeric keys (which are double-operation keys) but not auxiliary keyboard keys (0 to 9 and special characters TAB-,.). The auxiliary (numeric) key pad is mainly for convenience when performing a large number of numeric entries. The arrangement of these keys facilitates making the numeric entries, as opposed to using the main keyboard keys.

Only alpha key-operations are shifted by means of the CAP LOCK key. Numeric key operations (on main and auxiliary keyboards), as well as all special character key operations are not functionally affected by the CAP LOCK key. Typically, the ASCII code produced by an alpha numberic key closure represents simply the character typed. Thus, a typed y, Y, or 7 represents a y, Y, or 7. When used in conjunction with a CTRL or ESC key, however, the resulting ASCII code has an entirely different significance, depending upon which special operation has been selected. These special operations are described under Programming Considerations.

3.2.3 Special Character Keys

Functionally similar to the alphanumeric keys, the special character keys (shifted and unshifted) when used in the fashion of a conventional typewriter, produce ASCII codes which express the symbol on the key (refer to table 3-1, items 5 and 6). Also as for alphanumeric key operations, a CTRL, ESC, or special function code preceding the special character causes the resulting ASCII code to have special programming significance, as described under Programming Considerations.

3.2.4 Operational Control Keys

In addition to the terminal control keys described in paragraph 3.2.1, the keyboard contains a number of operational control keys which are used unshifted or shifted to provide specific machine operations. These keys consist of those keys not previously categorized as alphanumeric and special character keys (items 1 thru 6, table 3-1) with the exception of the ESC, CTRL, and F1 thru F16 keys. For the purpose of this discussion, the operational control keys have been grouped according to specific operations, each of which is discussed in detail in the paragraphs, which follow.

3.3 CURSOR CONTROL OPERATIONS

The cursor is a bright rectangular marker on the ADM-42 screen that indicates the entry point for the next character to be displayed. As characters are entered, the cursor moves from left to right across the display. When the cursor is positioned over a character already displayed, that character appears as a reverse image in the cursor. Cursor positioning may be controlled from the keyboard or from the remote computer. Operational control of the cursor is accomplished by using appropriately labeled operational control keys (unshifted or shifted) on the keyboard.

The following operational control keys control cursor position. In each instance, if the selected position is protected, the cursor moves along that line and to following lines, if necessary, to the first unprotected position.

- HOME — Moves the cursor to the first character position on the current page (top line, most left-hand position), or to the first unprotected position.
- ↓ — "Down Line" moves cursor to the same column or next unprotected position of the next lower line. Scrolling will take place unless AUTO PAGE or Protect Mode is set.
- ↑ — "Up Line" moves cursor to the same column or next unprotected position of the next higher line. When the top line is reached, cursor wraps around to the bottom line of the same page.
- ← — "Back Space" moves cursor one position to the left, or to the last unprotected position in the next preceding line.
- → — "Fore Space" moves cursor one position to the right, or to the first unprotected position in the next following line.
- NEW LINE — Causes cursor to move to the first unprotected position in the next lower line. Scrolling will take place unless AUTO PAGE or Protect Mode is set.
- SHIFT/TAB SET — Writes vertical column of protected spaces at cursor position, starting with line containing cursor. Protect Mode is automatically set.

- TAB/BACK TAB — In Protect Mode, cursor moves forward (unshifted) or backwards (shifted) to the next unprotected position following a protected field on page. If there is no "next unprotected position": for TAB, cursor moves to HOME position or to first unprotected position following HOME; for BACK TAB, cursor moves to end of page.

  In Typewriter Tab Mode, cursor tabs to tab set location as with a standard typewriter.

- RETURN — Moves cursor to first unprotected position in the line in which cursor rests.

- LINE FEED — Same as "Down Line".

3.4 DATA EDITING CONTROL OPERATIONS

The ADM-42 Data Display Terminal is equipped with complete data editing capabilities, either from the keyboard or computer. Editing using the computer is typically under the control of or is performed by a programmer; these operations are discussed under Programming Considerations. At the keyboard, the operator may use appropriately labeled special editing keys to accomplish the following editing activities:

- Character type-over
- Clear unprotected positions to spaces or nulls
- Clear entire screen to spaces or nulls
- Character insert/delete
- Line insert/delete
- Erase to end of line or field to spaces or nulls
- Erase to end of page to spaces or nulls
- Page change (forward/back)
- Page edit
- Auto Page set/reset

The following keys are used for data editing at the keyboard:

- PAGE EDIT, when pressed once establishes Page Edit Mode; "EDIT" is displayed in status line 25. When pressed again, it terminates Page Edit Mode; modifies movement of data for CHAR INSERT and CHAR DELETE operations when doing text editing.

- CLEAR SPACE (unshifted) clears all unprotected data from the screen and from memory, to space codes. When used with SHIFT, the key resets Protect Mode and clears all data from the screen and from memory, to space codes. These codes remain in memory until overwritten by other codes.

- CLEAR NULL (unshifted) clears all unprotected data from the screen and from memory, to null codes. When used with SHIFT, the key resets Protect Mode and clears all data from the screen and from memory, to null codes. These codes remain in memory until overwritten by other codes.

- CHAR INSERT may operate in combination with PAGE EDIT. When not operating in Page Edit Mode, the key moves character under cursor and all following characters one position to the right. If no protected field is encountered on the line, the operation terminates at the end of the line, and the last character on the line is lost (if the line is full). A space character is written under the cursor.

  When operating in Page Edit Mode, CHAR INSERT writes a space under the cursor and moves all following characters one position to the right and onto the following line when the line containing the cursor is full. Shifting stops when a protected field is encountered.

- CHAR DELETE operates in combination with PAGE EDIT. When not operating in Page Edit Mode, the key deletes character under the cursor. All characters that follow in the field or line move one position to the left and fill the space left by the deletion. A space or personality code is written in the last position of the field or line.

  When operating in Page Edit Mode, CHAR DELETE deletes character under the cursor. All unprotected characters between the cursor and the first protected field on the page shift one space to the left. A space or personality code is written in the last position of the field or line.

- LINE INSERT. Depressing the LINE INSERT key causes the entire line where the cursor is located and all lower lines, to shift downwards one line. This creates an empty line of unprotected spaces or personality code on which additional characters may be entered. If the entire page is filled when creating this new line, the bottom line is lost. The cursor moves to the first unprotected position of the new blank line. If in Write Protect Mode, LINE INSERT resets that mode. If in Protect Mode, operation is not performed.

- LINE DELETE. Depressing the LINE DELETE key causes the entire line on which the cursor is located to be erased. Simultaneously, all lower lines shift upwards one line. The cursor moves to the first character position of the first line (that moves upwards). The bottom line is filled with unprotected spaces or personality codes. If in Protect Mode, operation is not performed.

- LINE ERASE erases all characters, beginning with the cursor position, through the end of the line field that contains the cursor. Erased characters are replaced with space (unshifted) or null codes (shifted). If operating in the Write Protect Mode, space or null codes are written protected.

- PAGE ERASE erases all unprotected characters, starting at the cursor position and progressing through to the end of the data on display. Erased characters are replaced with space codes (unshifted) or null codes (shifted). If operating in the Write Protect Mode, pressing the PAGE ERASE key resets the Write Protect Mode.

- PAGE FWD shifts the display and the memory one page forward. When page 8 is reached, the shift is to page 1.

- PAGE BACK shifts the display and the memory one page backwards. When used with SHIFT, PAGE BACK sets AUTO PAGE Mode.

3.4.1 Editing Examples

In some installations, depending on the manner in which the ADM-42 is used, editing is an important consideration. Operators wishing to gain full use of the instrument's editing capabilities must become familiar with the operation of the keys listed above.

The following examples provide practice in the use of the editing keys:

Note

It should not be construed from these examples that the method presented is the only method of making the required editorial changes. Other steps can be taken that produce the same end result.

Table 3-2 is an example of formatted (protected and unprotected) data entry errors (unedited response) that are easily corrected, before sending the data to the remote computer. (The lines are numbered for illustrative purposes only, to refer to them in explaining how corrections are made.)

The operator reviews the data on display and corrects errors as follows:

Line 1. Press the HOME key. Cursor moves to the "D" position. Type R, and note that R replaces the D.

Note

If cursor does not move to the "D" position when the HOME key is pressed, the terminal is probably not operating in the Protect Mode. To place the terminal in the Protect Mode, press PROT MODE key.

Line 2. Press the LINE FEED key. Press the → key as necessary to place the cursor over the 8. Press the CHAR INSERT key, and note that everything on this line to the right of the cursor moves one space to the right. Type 8 to correct the error.

Line 4. Press the TAB key twice to move the cursor over the $ symbol. Press the CHAR DELETE key, and note that $ is erased and all characters on this line shift left one space to correct the error.

Table 3-2. Editing Example

QUERY	CORRECT RESPONSE	UNEDITED RESPONSE
1. Description:	Reclining Chair	Declining Chair
2. Stock No.:	RCB01887-04L	RCB0187-04L
3. Quantity:	1	1
4. Price:	369.95	$369.95
5. Sales Tax:	22.20	22.19
6. Total Amount:	392.15	392.14
7. Clerk No.:	23	23

Line 5. Press the NEW LINE key, and note that cursor moves over the first "2" on line 5. Press the → key to move the cursor over the "1". Type 20 to correct this entry.

Line 6. Press the ↑ key, and note that cursor moves straight down to line 6. Press the → key as necessary to move the cursor over the 4. Type 5 to correct the error.

In the following example, the first paragraph shows a partial page as it should have been prepared. The lines are numbered for purposes of illustration only, to simplify referencing to specific lines in subsequent paragraphs that show how the copy was actually prepared (second paragraph), and how the copy was corrected.

Corrected Copy

1. Some of the basic decisions in the $4.8 billion sales, which
2. can be blocked by Congress, were taken months ago and were no
3. surprise to observers of U.S. Middle East policy. But
4. timing of the announcement, capping a week of mutual U.S.
5. Israel recriminations and a high visibility Egyptian diplo-
6. matic offensive, almost seemed calculated to heat the atmos-

Unedited Copy

1. Some of the basic in the $4.8 billion sales, which can be
2. blocked by Congress, were taken months ago and were no sur-
3. timing of the announcement, capping a week of mutual U.S.
4. surprise to observers of U.S. Middle East policy. But the
5. Israel recriminations and a high-visibility Egyptian diplo-
6. matic offensive, almost includes some of the most sophisti-

The following corrections are based on the assumption that the CLEAR NULL key NULLS was pressed before any typing was done on the page containing these lines.

Line 1. Move the cursor to the space between "basic" and "in". (Use the HOME and → keys.) Use the CHAR INSERT key to provide 10 additional spaces between "basic" and "in". (Nine spaces for "decisions", plus an additional required space.) Press the "space bar; then type the word that was omitted: decisions. Move the cursor over the "c" in "can". Press PAGE EDIT, then key CHAR INSERT as necessary to cause "can be" to move to the second line.

Line 2. Move the cursor over the "b" in "blocked". Press the CHAR INSERT key and note that a space is inserted between "be" and "blocked". Move the cursor over "s" of "sur-"; then press the LINE ERASE key. Note that "sur" is erased.

Line 3. Move the cursor to the third line. Press the LINE DELETE key. Note that this line and all successive lines move up the page, thereby correcting line 3.

Line 4. Move the cursor to the new fourth line on the display. Press the LINE INSERT key. Note that this line and all successive lines move down the page, creating a new line in which information may be typed. Type the appropriate copy in line 4.

Line 6. Move the cursor to line 6 and position it over the "i" of "includes". Press the LINE ERASE key and note that everything from the position of the cursor to the end of this line is erased. Correct this line by typing the appropriate information.

Note

An alternate way of making corrections that involve making erasures, such as in line 6, is simply to write over the unwanted material. Replacing old material with new material is an automatic erasure.

3.5 DATA TRANSMISSION CONTROL OPERATIONS

Data which has been displayed on the CRT screen (and automatically stored in memory) may be transmitted to a remote computer. Modes of transmission include the Block Mode, Conversation Mode, Print Mode, Polling Mode, and ADM-1 Mode. Conversation Mode may be selected by pressing CONV MODE and observing the key light up. Block Mode may be selected by pressing CONV MODE a second time and observing the light go out. Polling Mode operations require a series of actions which are described under Polling, paragraph 3.9.

3.5.1 Transmission (Baud) Rates

The ADM-42 operates with a variety of computers, and sometimes communicates with the computer over telephone data lines. These conditions require different transmission (baud) rates from one installation to the next. Using the BAUD RATE switches located above the keyboard (see figure 1-5), it is possible to select a data transmission rate of 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, or 9600 depending upon the installation requirements. The baud rates set by these switches may be dynamically changed by an escape sequence, as described under Programming Considerations.

3.5.2 Block Mode Transmission

In the Block Mode, information is transmitted and received as complete messages or blocks of data (compared with character-by-character transmission in Conversation Mode). The operator enters the complete message. The characters are displayed and stored, but are not automatically transmitted. After the message has been completed, the operator can edit the information, then use a SEND MSG, SEND PAGE, or SEND LINE special operation key which causes all or part of the message to be transmitted. Refer to Programming Considerations for programmer-type information concerning the character codes associated with these operations.

Note

Personality changes will change and/or add to such Block Mode control codes as FS, US, and CR.

The following special-operation keys are used for Block Mode transmission:

- SEND LINE (unshifted) causes transmission of unprotected information starting at the beginning of the line in which the cursor is located and continuing through the original cursor position. Cursor stops at first cursor position, on next line, unless Protect Mode is set; then cursor returns to original position. Protected data is bracketed by FS (personality) codes. If ADM-1 Mode is set, FS codes are not transmitted. Pressing SEND LINE while pressing the SHIFT key causes all characters in the line containing the cursor (up to cursor position) to be transmitted, followed by a return code. Protected data is bracketed by "ESC)" and "ESC(". Scrolling will occur if SEND LINE is executed for bottom line.

- SEND PAGE (unshifted) causes transmission of unprotected characters in the displayed page, starting with the first unprotected character and continuing to the position the cursor was in when SEND PAGE was keyed, followed by a return code. Each protected field skipped is indicated by an FS (personality) code, and each line terminates in a US (personality) code. If ADM-1 Mode is set, FS and US codes are not transmitted. Pressing SEND PAGE while pressing SHIFT causes all characters on the page (through cursor position) to be transmitted. The shifted SEND PAGE causes protected data to be bracketed by "ESC)" and "ESC(".

- SEND MSG (unshifted) causes transmission of unprotected characters on the displayed page which are bracketed by SOM-EOM codes. The cursor backspaces until an SOM (STX) code is found, then all unprotected characters are transmitted until an EOM (ETX) code is encountered; then a return code is transmitted. If no STX is encountered, transmission starts at HOME position; if no ETX is encountered, transmission ends at the end of page. Pressing SEND MSG while holding the SHIFT key causes all characters in the message to be transmitted. Each protected field is indicated by an FS code, unless ADM-1 is set.

3.5.3 Example of Block Mode Transmission

In this Block Mode example, the ADM-42 is located at the cashier's stand in a furniture store. For each sale, the cashier fills out a form on the CRT screen. This action notifies the central computer of a change in inventory level and provides accurate inventory control.

1. The operator presses the appropriate F1 through F16 key. A three-character code (SOH/Char/CR) is produced which notifies the computer of a retail sale. (Code does not appear on the screen.)

2. The computer recognizes the code and responds with the following form in protected characters:

```
DESCRIPTION:
STOCK NO.:
QUANTITY:
PRICE:
SALES TAX:
TOTAL AMOUNT:
CLERK NO.:
```

3. The display is in the Protect Mode with the cursor in the space following DESCRIPTION. The cashier fills out the form. After each entry, she presses the TAB key, which positions the cursor to the first unprotected space following the next protected field--in this case, the space after the next item on the form.

```
DESCRIPTION:  SOFA BRN (TAB)
STOCK NO.:    01552 (TAB)
QUANTITY:     1 (TAB)
PRICE:        249.95 (TAB)
SALES TAX:    12.50 (TAB)
TOTAL AMOUNT: 262.45 (TAB)
CLERK NO.:    25
```

4. After completing the last entry on the form, the cashier operates the SEND PAGE key, which transmits the unprotected data (the cashier's entries only) to the central computer, in the following format: FS SOFA BRN US FS 01552 US FS 249.95 US....etc.

5. The computer then responds with an acknowledgement of message received, and clears the display.

3.5.4 Conversation Mode Transmission

In the Conversation Mode, information is transmitted character by character, as it is typed. The mode is typically used for interactive communication with the computer, where dialog with the computer is desired. Data will be transmitted either HALF DUPLEX or FULL DUPLEX, depending upon the setting of SW 8 of Switch Bank No. 1 (location 15M) within the terminal (see figure 1-5). During Conversation Mode transmission, execution of a command sequence either from the keyboard or the computer will cause the appropriate action at the terminal.

In the HALF DUPLEX mode of operation, information can be sent to or received from the computer, but in only one direction at a time. Characters are transmitted and displayed one character at a time, as they are typed. Received characters are displayed as they are received. In the FULL DUPLEX mode of operation, information can be transmitted and received simultaneously. Characters are transmitted one character at a time as they are typed, but are displayed on the CRT only when they have been echoed back from the computer. Received characters are displayed as they are received. Some keyboard operations are not transmitted; for example: EOM, SOM, CTRL, SHIFT, CHAR INSERT, PAGE EDIT, LINE INSERT, PAGE ERASE, PRINT, SEND LINE, BACK TAB, etc.

3.5.5 Example of Conversation Mode Transmission

In this Conversation mode example, the remote computer is running a conversational program instructing the operator in the use of the BASIC programming language. The computer asks a multiple-choice question which requires an operator response.

Computer: Before we can have the computer work with data, we must have the data read in with a statement.

(1. Read 2. Print 3. Data 4. None of these)

Operator: 1

Computer: Correct

Computer: All data that is read in using a read statement must appear in some statement.

(1. Input 2. Print 3. Data 4. None of these)

Operator: 1

Computer: Incorrect. The correct answer is 3. The input statement is similar to the read statement, but calls for the input to be made from the ADM-42 rather than from the data statements. Read and data go together.

.....And so on.

3.5.6 Serial Print Mode Transmission

Serial Print Mode transmission requires an asynchronous Serial Printer Interface installation as described in Section 2 of this manual. The interface can be used with RS-23-C compatible serial printers, including buffered printers, as well as character-by-character printers. With this interface, the information input from the computer is buffered to make it available for editing and additions from the terminal prior to printing. In addition, the printer can be operated at any one of the transmission baud rates listed in paragraph 3.5.1. The Print Mode can be initiated from the keyboard using the PRINT key, or SHIFT/PRINT keys. The Print Mode can also be entered by means of escape sequence initiated from the keyboard or the remote computer. Using the PRINT key or the SHIFT/PRINT keys, data can be sent to the printer in one of two modes: page format and free form. An additional buffered Print Mode is available via an "ESC " sequence. Also, printing protected fields as spaces is available via an ESC @" sequence.

In either the page format or free form mode, data is transmitted continuously as long as the printer and the terminal are ready. These conditions are monitored to provide printer/terminal control in the following manner (see figure 2-5):

1. The serial printer interface is enabled by setting SW 8 of Switch Bank 4 (location 3L on option PCBA) to ON and SW 2 at switch location 4A to ON, thus enabling the CLEAR TO SEND line.

2. When the terminal is ready to transmit data, REQUEST TO SEND (RTS) is sent to the printer.

3. If the printer is ready, it signals not BUSY over the CLEAR TO SEND (CTS) line, which alerts the terminal. Depending upon which printer is selected, CTS (NOT BUSY) may be active when high or low. SW 2 and SW 3 at switch location 4A are provided to accommodate each style printer. SW 2 must be ON to allow external printer control. Then, if SW 3 is ON, BUSY (NOT READY) is active low; if OFF, BUSY (NOT READY) is active high.

Print Format Mode allows data to be printed exactly as displayed on the CRT screen. Transmission is initiated by pressing the PRINT key at the desired print operation stopping position. (Print Format Mode can also be entered via a keyboard-initiated or computer-initiated "ESC P" sequence.) The following takes place:

1. "PRNT" is displayed in status line 25 and "EM" is written at the cursor position as a STOP code.

2. The cursor is moved to the HOME position.

3. The code sequence CR LF NULL is sent to the printer, followed by the data displayed on the screen.

4. NULL characters are sent as spaces and trailing nulls and spaces on a line are not sent. When the last character on each line is sent, the terminal sends the CR LF NULL sequence before moving to the next line.

5. Upon reaching the STOP code, the operation is terminated, a final CR LF NULL is sent, and the STOP code (EM) is overwritten with a space.

Note

A STOP code within the text will cause the printing to stop at that point.

6. Breaks in the transmission may occur to allow for mechanical printer operations or other delays, by means of the printer READY logic described above. If the printer goes BUSY upon receipt of a control character (CR, LF, etc.) that character should be followed by one or two RUB out characters to ensure that no data will be lost.

Free Form Format Mode transmits a continuous stream of data without inserting control characters and without internal ADM-42 delays. This mode allows greater flexibility in formatting the printed copy, especially with printers having other than 80-character lines. Transmission is initiated by executing the following sequence:

1. Write a STOP CODE (EM) at the desired position using the cursor.

2. Enter all control codes in text using local or remote escape, CTRL or FUNCTION operations, but only while the terminal is in Program Mode. Such control codes include: CR, LF, FF, VT, BEL, ESC, BS, FS, GS, RS, and US.

3. Move cursor to HOME position.

4. Execute SHIFT/PRINT or "ESC p". "PRNT" is displayed in Line 25 and transmission starts and continues without delay or line feed breaks until STOP CODE (EM) is reached. STOP CODE is not overwritten.

5. Breaks in the transmission may occur to allow for mechanical printer functions or other delays, by means of the printer BUSY logic described above. If the printer goes BUSY upon receipt of a control character (CR, LF, etc.) that character should be followed by one or two RUB out characters to ensure that no data will be lost.

3.5.7 Parallel Print Mode Transmission (future)

3.5.8 Buffered Print Mode Transmission (refer to Programming Considerations)

3.5.9 ADM-1 Mode Transmission (refer to Programming Considerations)

3.5.10 Polling Mode Transmission (refer to Polling)

3.6 PROGRAM MODE

Program Mode is a mode of operating the terminal typically used for establishing non-standard text formats for transmission. In Program Mode, characters are written in memory (and displayed) in a continuous stream, without internal delays. Control characters (CR, LF, FS, etc.) are written as they are keyed, and the appropriate symbols are displayed. For exampel, CR, LF, and FS would be displayed: $^{C}_{R}$ $^{L}_{F}$ $^{F}_{S}$. Program Mode may be initiated from the keyboard by pressing the PROG MODE key and observing that "PROG" is displayed in status line 25. Pressing PROG MODE again terminates Program Mode. Program Mode may also be initiated from the keyboard or the remote computer by an ESC U sequence and terminated by an ESC X or ESC u sequence.

3.7 SPECIAL ADM-42 CHARACTERISTICS

3.7.1 Protected Fields/Characters

Areas on the ADM-42 display may be designated by the operator or by the computer as protected fields. These fields appear at reduced intensity and have the following characteristics:

1. Protected fields cannot be typed over as long as the terminal is operating in the Protect Mode.

2. Forms appearing on the display initiated by the computer are usually in protected characters.

3. Protected fields cannot be overwritten by the remote computer unless the ADM-42 is first removed from the Protect Mode.

Designating Protected Fields

The operator has complete control over any character that he types on the CRT screen. Consequently, he may elect at any time to protect or to leave unprotected any character (or field of characters) that he, and not the computer, originates. To type protected characters, it is necessary to be in the Write Protect Mode of operation. The Mode is obtained with the WRITE PROT and SHIFT keys or an escape sequence. Characters typed while in this mode may then be protected by operating in the Protect Mode, which is established with the PROT MODE key or an escape sequence.

Write Protect Mode

The Write Protect Mode is established with the WRITE PROT key in the following manner:

1. Press and hold down either SHIFT key.
2. While holding SHIFT depressed, momentarily press WRITE PROT. Note that "WPRT" is displayed in status line 25.
3. To terminate Write Protect Mode, press WRITE PROT a second time. Note that "WPRT" is removed from line 25.

Protect Mode

The Protect Mode is established with the PROT MODE key in the following manner:

1. Press the alternate action PROT MODE key. Note that "PROT" is displayed in status line 25.
2. To terminate Protect Mode, press PROT MODE a second time. Note that the light in the key goes out.

Protect Mode is also established automatically when TAB SET is keyed, establishing a column of protected spaces on the page in vertical alignment with the cursor, from cursor position to the end of the page.

3.7.2 Status Line Characteristics

Status line 25 on the CRT is reserved for various types of status information. Each type, when called for, is displayed in the same area of the status line at all times. All data shown in character positions 1 through 60 and 66 through 75 is shown reversed. The remaining five positions (reserved for status S4) is reversed and blinking. The following chart tests the character positions and the data they contain.

CHARACTER POSITIONS	DISPLAY	STATUS INFORMATION
1-10	PG=X	Current Page No. X, where "X" may be 1 thru 8.
11-15	EDIT	Edit Mode ON
16-20	PROG	Program Mode ON
21-25	PROT	Protect Mode ON
26-30	WPRT	Write Protect Mode ON
31-35	INSM	Insert Mode ON
36-40	LOCK	Keyboard Locked
41-45	ADM1	ADM-1 Mode ON
46-50	PRNT	Print Mode ON
51-60	PARITY ERR FRAME ERR OVERFW ERR	Error messages, one at a time
1-60	(User Msg)	Alternate message from the host computer; replaces any other message on display. May be called up from keyboard (in response to a blinking S4) by "ESC F".
66-67 70-71 74-75 78-79	S1 S2 S3 S4	User (host) set and cleared indicators. S4, when blinking signifies an important message awaiting which may be called up by "ESC F".

3.8 PROGRAMMING CONSIDERATIONS

The ADM-42 contains electronic circuitry which allows the remote computer full control over the data terminal. All control operations which are possible from the keyboard can also be executed from the computer. At the keyboard these control operations are initiated and/or terminated by using the CTRL, ESC, and F1 through F16 function keys in combination with one or more alpha numeric or special operation keys. The coding thus produced duplicates the coding required or produced by the computer; the discussion that follows, however, focuses on the methods of producing the codes using keyboard procedures. The types of special control operation available, together with the coding required, are listed in table 3-3, and discussed as required in paragraphs 3.8.1 through 3.8.10.

3.8.1 CTRL Key Operations

The CTRL key is always used in combination with an alpha or special character key. Pressing the CTRL key modifies the ASCII code of the selected standard character to a special control operation code. Figure 3-2 shows a portion of the standard ADM-42 graphic set, along with the hex coding (columns 4 and 5) which identifies and locates the standard characters. Columns of 0 and 1 of the chart show 32 CTRL codes and the modified characters (symbols) produced by using the CTRL key; these symbols occupy the same relative positions in the columns as the standard keyboard characters they modify. Pressing the CTRL key will cause the CTRL code to be applied only to the terminal; no code would be transmitted to the computer. In Program Mode (refer to paragraph 3.6) the CTRL character to be transmitted to the computer will be written on the CRT screen as the character is keyed.

			FUNCTION		GRAPHIC CHARACTER SET					
HEX			0	1	2	3	4	5	6	7
	BITS 4321	BITS 765	000	001	010	011	100	101	110	111
0	0000		NUL	DLE		0	@	P	`	p
1	0001		SOH	DC1	!	1	A	Q	a	q
2	0010		STX	DC2	"	2	B	R	b	r
3	0011		ETX	DC3	#	3	C	S	c	s
4	0100		EOT	DC4	$	4	D	T	D	t
5	0101		ENQ	NAK	%	5	E	U	e	u
6	0110		ACK	SYN	&	6	F	V	f	v
7	0111		BEEP	ETB	'	7	G	W	g	w
8	1000		(←) BS	CAN	(	8	H	X	h	x
9	1001		(SKIP) HT	EM	)	9	I	Y	i	y
A	1010		LF (↓)	SUB	*	:	J	Z	j	z
B	1011		VT (↑)	ESC	+	;	K	[	k	{
C	1100		FF (→)	FS	,	<	L	\	l	¦
D	1101		CR	GS	-	=	M	]	m	}
E	1110		SO	(HOME) RS	.	>	N	^	n	~
F	1111		SI	(NEW LINE) US	\	?	O	_	o	DEL

Figure 3-2. ADM-42 Standard Graphic Character Set, Showing Comparable CTRL Codes

Table 3-3. Special Control Operations

CONTROL	PAR. REF.	OPERATION
1. CTRL or SHIFT/CTRL Operations:	3.8.1	
KEYS DISPLAY		ASCII CODE (OPERATION)
CTRL @ space ( )		NULL (No op)
CTRL a/A S_H		SOH (Start of Heading)
CTRL b/B S_X		STX (Start of Text)
CTRL c/C E_X		ETX (End of Text)
CTRL d/D E_T		EOT (End of Transmission)
CTRL e/E F_Q		ENQ (Inquiry - who are you)
CTRL f/F A_K		ACK (Acknowledge)
CTRL g/G B_L		BEL (Audible Alarm)
CTRL h/H B_S		BS (Back Space)
CTRL i/I H_T		HT (Horizontal Tab)
CTRL j/J L_F		LF (Line Feed)
CTRL k/K V_T		VT (Up Line)
CTRL l/L F_F		FF (Forespace)
CTRL m/M C_R		CR (Carriage Return)
CTRL n/N S_O		SO (Shift Out)
CTRL o/O S_I		SI (Shift In)
CTRL p/P D_L		DLE (Data Link Escape)
CTRL q/Q D_1		DC1 (Device Control 1)

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
1. CTRL or SHIFT/CTRL Operations (cont'd):		3.8.1	
KEYS	DISPLAY		ASCII CODE (OPERATION)
CTRL r/R	D_2		DC2 (Device Control 2)
CTRL s/S	D_3		DC3 (Device Control 3)
CTRL t/T	D_4		DC4 (Turns Printer buffer off-line; Printer continues printing until buffer is empty.)
CTRL u/U	N_K		NAK (Not Acknowledged)
CTRL v/V	S_Y		SYN (Synchronous Idle)
CTRL w/W	E_B		ETB (End of Transmission Block)
CTRL x/X	C_N		CAN (Cancel)
CTRL y/Y	E_M		EM (End of Medium)
CTRL z/Z	S_B		SUB (Substitute)
CTRL [	E_C		ESC (Escape Sequence)
CTRL \	F_S		FS (File Separator)
CTRL]	G_S		GS (Group Separator)
CTRL ^	R_S		RS (Cursor HOME)
CTRL -	U_S		US (New Line)

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
2. ESC Key Operations:		3.8.2	
KEYS	OPERATION		DESCRIPTION
ESC [ ]			Escape Sequence defined by [characters representing ASCII codes desired].
ESC M (*)	MULT ESC		Perform multiple escape sequences one at a time without keying "ESC" each time (* = successive Escape Sequence characters). Operation is terminated by any control characters.
3. Function F1 thru F16 Key Operations:		3.8.3	For special-character operations (primarily for transmission).
KEYS	OPERATION		DESCRIPTION
F1 thru F16 (unshifted)	FUNKEY		Transmits "SOH/Character (@ thru O)/CR".
SHIFT/F1 thru F16	FUNKEY		Transmits "SOH/Character (` thru o)/CR".
ESC ! []	PRGM FNCTN		Program and/or display FUNKEY [characters for F1 thru F16].
ESC []	EVOKE FNCTN		Evoke message stored under [F1 thru F16 character]

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
4. Personality Control:		3.8.4	
KEYS	OPERATION		DESCRIPTION
ESC . [ ]	PRGM PERSONALITY		Change personality character [(HEX number 0 - F) to (HEX character)] .
ESC o O	DSPLY PERS		Display personality lead in characters: clear screen to NULLS; 4 rows in HEX coding.
5. Terminal/Mode Control:		3.8.5	
KEYS	OPERATION		DESCRIPTION
ESC "	KBD ENA		Enables keyboard operations (remote only).
ESC #	KBD DISA		Disables all keyboard operations except reset. (SHIFT/RESET keys must be operated to restore key board.)
ESC $	CLR ADM-1		Clears ADM-1 Mode.
ESC %	SET ADM-1		Sets ADM-1 Mode.
ESC <	STA 4 ON		Place/remove Status 4 display on line 25.
ESC >	STA 4 OFF		
ESC F	MSG 25		Place message on line 25 (remote only).
ESC b	STA 1 OFF		Remove/place Status 1 display on line 25.
ESC c	STA 1 ON		
ESC d	STA 2 OFF		Remove/place Status 2 display on line 25.
ESC e	STA 2 ON		

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
5. Terminal/Mode Control (cont'd):		3.8.5	
KEYS	OPERATION		DESCRIPTION
ESC f ESC g	STA 3 OFF STA 3 ON		Remove/place Status 3 display on line 25.
ESC Z	MODES CLR		Clear all dynamically set modes.
6. Cursor Control:		3.8.6	
KEYS	OPERATION		DESCRIPTION
ESC i ESC I	TAB BACKTAB		Slew cursor to next tab forward/backward (Protect Mode and Typewriter Mode).
ESC - (*)	LOAD PRC		Load cursor page, row, column.
ESC /	READ PRC		Read cursor page, row, column.
ESC = (*)	LOAD RC		Load cursor row, column.
ESC ?	READ RC		Read cursor row, column.
(*= YX Position)			Absolute cursor position.
CTRL h/H	BS		Backspace
CTRL i/I	HT		Horizontal Tab
CTRL k/K	VT		Vertical Tab
CTRL l/L	FF		Forespace
CTRL m/M	CR		Carriage return
CTRL ^	RS		HOME

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR REF.	OPERATION
7. Format Control:		3.8.7	
KEYS	OPERATION		DESCRIPTION
ESC &	SET PROTM		Set Protect Mode.
ESC '	CLR PROTM		Clear Protect Mode.
ESC (	CLR WPROT		Clear Write Protect Mode.
ESC)	SET WPROT		Set Write Protect Mode.
ESC I	BACKTAB		Slew cursor backward to next tab.
ESC U	SET PGM MODE		Set Program Mode.
ESC V	SET PROT COL SP		Set column of protected spaces for tabs. Sets Protect Mode.
ESC X	CLR PGM MODE		Clear Program Mode.
ESC i	TAB		Slew cursor forward to next tab.
ESC u	CLR PGM MODE		Clear Program Mode.
ESC v	SET ATUO PG		Set AUTO PAGE function.
ESC w	CLR AUTO PG		Clear AUTO PAGE function.
ESC 3 p	SET TAB MD		Set typewriter Tab Mode, except when Protect Mode is set.
ESC 3 [ ]	SET MODULUS TAB		Set Tab at Modulo [1-79]. (See figure 3-4).
ESC 3 Sp	RESET TAB MODE		Resets all Typewriter Mode settings.
In Typewriter Tab Mode:			
ESC 2	CLR TAB		Clear column of tabs under cursor for entire page.

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
7. Format Control (cont'd):		3.8.7	
KEYS	OPERATION		DESCRIPTION
ESC 1	SET TAB		Set column of tabs under cursor for entire page.
ESC 0	CLR TABS		Clear all typewriter tabs except SET MODULUS tabs.
CTRL @	NULL		No Op.
CTRL a/A	SOH		Start of heading.
CTRL b/B or ESC 8	STX (SOM)		Start of text (message).
CTRL c/C or ESC 9	ETX (EOM)		End of text (message).
CTRL d/D	EOT		End of transmission.
CTRL w/W	ETB		End of transmission block.
CTRL y/Y	EM		End of message.
CTRL \	FS		Field Separator.
CTRL]	GS		Group Separator.
CTRL ^	RS		Cursor HOME.
CTRL -	US		New Line.

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
8. Data Editing Control:		3.8.8	
KEYS	OPERATION		DESCRIPTION
ESC :	CLR FG TO NULL		Same as CLEAR NULL key.
ESC *	CLR ALL TO NULL		Same as SHIFT/CLEAR NULL keys.
ESC ;	CLR FG TO SP		Same as CLEAR SPACE key.
ESC +	CLR ALL TO SP		Same as SHIFT/CLEAR SPACE keys.
ESC ,	CLR ALL PROT SP		Clear all data on page; replace with protected space codes.
ESC E	LINE INSERT		Same as LINE INSERT key.
ESC J	PAGE BACK		Same as PAGE BACK key.
ESC K	PAGE FWD		Same as PAGE FWD key.
ESC L	GO TO PG (N)		Go to page 1 thru 8 (N).
ESC N	SET PG EDIT		Same as PAGE EDIT key.
ESC O	RESET PG EDIT		
ESC Q	CHAR INSERT		Same as CHAR INSERT key.
ESC R	DEL LINE		Same as LINE DELETE key.
ESC T	ERASE LINE TO SPACES		Same as LINE ERASE key.
ESC W	DEL CHAR		Same as CHAR DELETE key.

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
8. Data Editing Control (cont'd):		3.8.8	
KEYS	OPERATION		DESCRIPTION
ESC Y	ERASE PG TO SPACES		Same as PAGE ERASE key.
ESC m (Y) (X)	WRITE MULT CHAR		Write ASCII character (X) a modulo number of times (Y). (See figure 3-4).
ESC q	SET INS MODE		Set Insert Mode.
ESC r	CLR INS MODE		Clear Insert Mode.
ESC t	LINE ERASE NULL		Same as SHIFT/LINE ERASE keys.
ESC y	ERASE PG TO NULL		Same as SHIFT/PAGE ERASE keys.
9. Data Transmission Control:		3.8.9	
KEYS	OPERATION		DESCRIPTION
ESC 4	SEND LINE FG		Same as SEND LINE key.
ESC 5	SEND PAGE FG		Same as SEND PAGE key.
ESC 6	SEND LINE ALL		Same as SHIFT/SEND LINE keys.
ESC 7	SEND PAGE ALL		Same as SHIFT/SEND PAGE keys.
ESC 8	WRITE SOM (STX)		Write STX character on screen.
ESC 9	WRITE EOM (ETX)		Write ETX character on screen.
ESC B	SET BLOCK		Set Block Mode.

Table 3-3. Special Control Operations (cont'd)

CONTROL		PAR. REF.	OPERATION
9. Data Transmission Control (cont'd):		3.8.9	
KEYS	OPERATION		DESCRIPTION
ESC C	SET CONV		Set Conversation Mode.
ESC DH	H DUPL		Set dynamic half duplex mode.
ESC DF	F DUPL		Set dynamic full duplex mode.
ESC P	PRNT PG ALL		Print all data on page.
ESC S	SEND MSG FG		Same as SEND MSG key.
ESC a 0 ESC a 1	AUX CTRL OFF AUX CTRL ON		Disables/enables RCVE data via ASYNC PRINTER port interface.
ESC p	PRNT UNF		Same as SHIFT/PRINT key.
ESC s	SEND MSG ALL		Same as SHIFT/SEND MSG keys.
ESC @	PRNT PROT AS SPACES		Print protected data as spaces, similar to ESC P.
ESC [(Mult.)	PRNT CTRL		Buffered Print Mode: establish printing characteristics using multiple characters.
ESC / [1 (HEX 31) thru 8 (HEX 38)]	READ PRC		Read cursor row (Y) and column (X) on [selected page (1 thru 8)].
ESC ?	READ RC		Read cursor row (Y) and column (X) on current page.

Table 3-3. Special Control Operations (cont'd)

CONTROL	PAR. REF.	OPERATION
9. Data Transmission Control (cont'd):	3.8.9	
KEYS OPERATION		DESCRIPTION
ESC [ ] CHG BAUD RATE		Change Baud Rate to: [@ - N] for MODEM Port; [` -n] for ASYNC PRNTR Port.
CTRL t/T PRNTR OFF		Terminates Buffered Print Mode; turns off printer.
10. Video Attribute Control:	3.8.10	
KEYS OPERATION		DESCRIPTION
ESC G ATTRIB CTRL		Change video attribute control to operation defined by [0 to E].
ESC ^ BLINK CTRL		Cause field bracketed by "^" to blink.
ESC _ BLANK CTRL		Cause field bracketed by "_" to be blanked or underlined.
ESC ~ 0 VIDEO OFF		Shuts off video.
ESC ~ 1 CURSOR OFF		Restore video; turns off cursor.
ESC ~ 2 CURSOR STDY		Restore video; establish steady cursor.
ESC ~ 3 CURSOR BLINK		Restore video; establish blinking cursor.
11. Polling Control:	3.10	
KEYS OPERATION		DESCRIPTION
ESC ` [ ]		Special Polling functions defined by [character] - local control only.

3.8.2 ESC Key Operations

The ESC key is another key that is always used in combination with one or more alphanumeric or special character keys to produce "escape sequence" operations. Figure 3-3 shows the various escape sequences available in the ADM-42 and the ASCII characters which are required to initiate the sequence. Escape sequences are typically initiated by the computer. When initiated from the keyboard, the escape character and the desired ASCII character can be transmitted to the computer. In Program Mode the escape sequence characters are also displayed on the CRT screen.

Multiple escape sequences can be programmed without preceding each ASCII character with the ESC key, thus facilitating operations which require more than one escape sequence. This operation is activated by ESC M and terminated by pressing any control key (CR, LF, HOME, CTRL, etc.).

3.8.3 Function Key (FUNKEY) Operations

Standard FUNKEY Operations

Functions keys F1 thru F16 are used to transmit specific codes. These codes may be employed by the programmer in any way that will simplify or expedite work. Typically, the codes used are not committed for any special purpose until assigned by the programmer. Another 16 characters are available by pressing and holding SHIFT while operating a function key. When pressed, each key F1 thru F16 causes a three-character code to be produced: "SOH/ASCII Character/CR". The special-function ASCII characters available are as follows:

FUNKEY	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16
UNSHIFT	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SHIFTED	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o

To transmit a FUNKEY code using an F1 through F16 key, simply press the appropriate key. The SOH code will be transmitted to the host.

To transmit a FUNKEY code using an escape sequence, execute "ESC\[@ thru O]" for unshifted function, or "ESC\[` thru o]" for shifted function. The SOH code will be transmitted to the host.

Note

In the above operations, the 31-or 63-character storage option is not installed.

Optional FUNKEY Operations

When the optional 31- or 63-character option is installed, it is possible to store a message under any one or combination of F1 thru F16 function keys. Thus, whenever the (first) key is called for either by a key operation or escape sequence, the stored message will be transmitted either to the host computer or to an auxiliary device. The destination of the message is established atthe time it is written by preceding the message with an "H", "K", or "A", as follows:

- An "H" signifies that the message is to be transmitted only to the host computer when evoked. Message is not displayed on the ADM-42 screen.
- A "K" signifies that the message is for display on the ADM-42 screen. Message is transmitted to the host computer only if CONV MODE is set.
- An "A" signifies that the message is to be transmitted only to the auxiliary printer when evoked. Message is not displayed on the ADM-42 screen.

Storing FUNKEY Message Using CTRL Key

Proceed as follows:

1. Execute "ESC *" (CLEAR ALL NULL) to clear the screen to null codes.
2. Terminate CONV MODE, if set.
3. Enter "H", "K", or "A" as desired.
4. Enter the message just as it is to be stored. Cursor should be at the end of the message.
5. Execute "CTRL / [F1 thru F16]" (unshifted or shifted) to store the message under the selected FUNKEY.

	ESCAPE SEQUENCE					
HEX	2	3	4	5	6	7
0		0 CLEAR TABS	@ PRINT PROT AS SPACES*	P PRINT PAGE ALL	` POLLING ADDRESS*	p PRINT (UNF)
1	! PROG FNCTN*	1 SET TAB	A	Q CHAR INSERT	a AUX CONTROL*	q INSERT MODE ON
2	" ENABLE KEYBD	2 CLEAR TAB	B SET BLOCK	R LINE DELETE	b STATUS 1 OFF	r INSERT MODE OFF
3	# DISABLE KEYBD	3 SET TAB MODE*	C SET CONV	S SEND MSG FG	c STATUS 1 ON	s SEND MSG ALL
4	$ CLEAR ADM1 M	4 SEND LINE FG	D DUPLEX CONTROL*	T LINE ERASE SP	d STATUS 2 OFF	t LINE ERASE NUL
5	% SET ADM1 M	5 SEND PAGE FG	E LINE INSERT	U PROGM MODE SET	e STATUS 2 ON	u PROGM MODE CLR
6	& SET PROTECT	6 SEND LINE ALL	F MESSAGE TO ROW 25*	V SET PROT COL OF SP	f STATUS 3 OFF	v AUTO PAGE ON
7	' RESET PROTECT	7 SEND PAGE ALL	G ATTRIBUTE CONTROL*	W CHAR DELETE	g STATUS 3 ON	w AUTO PAGE OFF
8	(CLEAR WPROT	8 WRITE SOM (STX)	H	X PROGM MODE CLR	h	x
9	) SET WPROT	9 WRITE (ETX) EOM	I BACKTAB	Y ERASE PAGE SP	i SKIP (TAB)	y PAGE ERASE NUL
A	* CLR ALL TO NUL	: CLR FG NUL	J PAGE BACK	Z MODES CLEAR	j	z
B	+ CLR ALL TO SPACE	; CLR FG SPACE	K PAGE FWD	[PRINT CONTROL*	k	{
C	, CLR ALL TO PROT SP	< STATUS 4 ON	L GO TO PAGE N (1-8)*	\ ENVOKE FUNCTION*	l	| CHANGE BAUD RATE*
D	- LOAD PG & CURS	= LOAD CURSOR	M MULT ESC*	]	m WRITE MULT CHAR*	}
E	. PROGRAM PERSONALITY*	> STATUS 4 OFF	N SET PAGE EDIT	^ BLINK CONTROL	n	~ VIDEO & CURSOR CONTROL
F	/ SEND PG & CURS	? SEND CURSOR	O RESET PAGE EDIT	_ BLANK CONTROL	o DISPLAY PERSONALITY	DEL

*Requires additional characters to complete sequence

Figure 3-3. ADM-42 Escape Sequence Characters, With HEX Coding

Erasing FUNKEY Message Using CTRL Key

Proceed as follows:

1. Execute "ESC *" (CLEAR ALL TO NULL).
2. Enter "X".
3. Execute "CTRL / [F1 thru F16] " to erase the message stored under the selected FUNKEY.

Storing FUNKEY Message Using Escape Sequences

Proceed as follows:

1. Execute "ESC *" (CLEAR ALL TO NULL).
2. Terminate CONV MODE, if set.
3. Enter "H", "K", or "A", as desired.
4. Enter the message just as it is to be stored. Cursor should be at the end of the message (after the last character).
5. Execute "ESC ! [@ thru O] " to store the message under the selected unshifted FUNKEY, or "ESC ! [` thru o]" to store the message under the selected shifted FUNKEY.

Erasing Specific Stored FUNKEY Message Using Escape Sequences

Proceed as follows:

1. Execute "ESC *" (CLEAR ALL TO NULL).
2. Execute "ESC ! [@ thru O] " to erase the message stored under the selected unshifted FUNKEY, or "ESC ! [` thru o]"to erase the message stored under the selected shifted FUNKEY.

Erasing All Stored FUNKEY Messages Using Escape Sequences

To erase all messages stored under the F1 thru F16 function keys, execute: "ESC ! X".

Displaying All Stored FUNKEY Messages Using Escape Sequences

Messages stored under function keys F1 thru F16 may be displayed on the ADM-42 screen without transmitting. The display will list all FUNKEY F1 thru F16 messages, one message per line (63 characters, maximum). If the FUNKEY does not contain a message, "X" will be displayed, instead. To display messages stored under FUNKEY, proceed as follows:

1. Terminate CONV MODE, if set.

2. Execute: "ESC ! 1" for unshifted (@ thru O) FUNKEY display, or "ESC ! 2" for shifted (` thru o) FUNKEY display.

Evoking Stored FUNKEY Message Using Escape Sequences

A message stored under a specific FUNKEY may be "evoked" (called up) for transmission by means of an escape sequence. The evoke message, is transmitted and/or displayed in accordance with the "H", "K", or "A" instructions which precede the stored message. To evoke a stored message, proceed as follows:

1. Set CONV MODE (ESC C), if not set.

2. Execute: "ESC \[@ thru O]" for an unshifted FUNKEY message or "ESC \[thru o] " for a shifted message.

3.8.4 Personality Control Operations

The personality attributes which were assigned (or unspecified) to the ADM-42 terminal at the time of purchase can be temporarily modified at any time by the operator from either the keyboard or the host computer. The temporary or "dynamic" modification, which is terminated when power is removed from the terminal, is provided to allow the operator to alter certain character codes which may (for example) cause computer program interrupts if used as established. A personality change can be effected from the keyboard by entering "ESC." followed by the HEX number of the code to be changed, then one or more HEX character codes which identify the new ASCII dynamic character(s). The HEX character in the ADM-42 standard graphic set (figure 3-2). The keyboard operations which effect the dynamic personality change are not written on the CRT screen or transmitted to the host computer.

The personality attributes applicable to the terminal may be displayed by executing an "ESC o0" sequence. The terminal will clear screen to nulls, then display four rows of personality characters, 16 HEX bytes to a row. "(ESC o9" displays the date of the firmware.) The information contained in each row is as follows:

- The first row displays all the personality defaults installed in the terminal. This row is non variable.
- The second row displays all the personality defaults which may be dynamically changed.
- The third and fourth rows are not defined.

The personality defaults subject to dynamic change are initiated by an "ESC.[]" sequence. Within the brackets are two character codes: HEX number (0 to F) which expresses the personality default to be changed; followed by the HEX code of the ASCII replacement character, as follows:

Escape Lead-In and Transmit Characters

The sequence "ESC. [0 (HEX)]" adds a new escape lead-in character to the standard escape character. (The standard character is a bona fide computer character and cannot be changed.) Thus, the terminal will execute an escape sequence in response to the new character, as well as to the standard ESC character. During transmission, the new character will be transmitted in place of the standard character whenever ESC is called for.

Note

The dynamic personality change associated with the escape lead-in character is different from the other dynamic personality changes, in that the standard lead-in character cannot be changed, only added to. In all other dynamic personality changes, the standard character is temporarily replaced by the new character.

End Block Characters

"ESC. [1 (HEX)]" changes the standard End Block character to the selected (HEX Code) character. A second End Block character may be added using an "ESC. [2 (HEX)]" character. The second End Block character may be a new line or line feed character if desired. Both End Block characters would be imbedded in the text whenever the first End Block character was called for.

New Line Characters

"ESC. [3 (HEX)]" changes the standard New Line character and "ESC. [4 (HEX)]" adds a second New Line character, in the same manner as for End Block characters, above.

Other Personality Characters

- "ESC. [5 (HEX)]" establishes a new character for the standard Field Separator character.

- "ESC. [6 (HEX)]" establishes a new character for the standard FUNCTION lead-in character.

- "ESC. [7 (HEX)]" establishes a character which would be written on the screen when a parity error is sensed (not provided on standard ADM-42). The parity error character should be one the customer does not normally use.

- "ESC. [8 (HEX)]" establishes a new character for the character previously assigned to the Clear Screen command (usually a space code). The new character may be NULL, period, underline, etc. Only LINE DELETE, LINE INSERT, and CHARACTER DELETE operations are affected.

- "ESC. [9 (HEX)]" establishes the delay, in milliseconds, between the Request to Send (RTS) signal and the actual beginning of transmission (CTS) in a Block Mode transmission.

  The HEX number is a two-character expression where in the number, multiplied by 2 is the value of the delay, in milliseconds. Thus: the HEX number 05 represents a delay of 10 milliseconds.

- "ESC. [B (HEX)]" establishes certain conditions which are applicable when the Polling Option is in effect. The HEX code identifies a firmware bit which is set = 1 in order to establish the desired condition. Multiple conditions may be establisehed by using the appropriate HEX codes; however, all bits must be set at the same time.

HEX CODE	BIT SET=1	CONDITION
B01	0	Headers are required in ADM-42 response; otherwise headers are not required (ADM-2 compatible response).
B02	1	Any keyboard key may be used to switch from LOCAL to POLLING mode; otherwise, CONV MODE key must be used.
B04	2	Remote FAST SELECT command is conditional; otherwise, is unconditional.

HEX CODE	BIT SET=1	CONDITION
B08	3	Terminal automatically returns to LOCAL mode after POLLING message is completed; otherwise, terminal returns to IDLE Mode.
B10	4	Inhibits transmission of last character (under cursor) in Block Mode; otherwise, last character is sent.
B20	5	Reserves last page for print buffer.
B40	6	Enables polling communications buffer. Incoming data is held in buffer until message is completed. If there are no errors, message is then placed on screen. Otherwise, incoming data goes directly to screen.

- "ESC. [C (HEX)]" establishes the number of POLLING transmissions which will be counted before recycling (repeat transmissions do not increment the transmission number). Transmission numbers are sent only if headers are sent. The two character HEX number (00 -09) establishes the following operations:

C00	Inhibits the transmission number so that it does not appear in the ADM-42 response to a polling inquiry.
C01 thru C09	Establishes the maximum number of transmissions to be counted before recycling. (If the HEX number is 01, the transmission number will alternate between 0 and 1 for each transmission.)

- "ESC. [D (HEX)]" Reserved

- "ESC. [E (HEX)]" establishes which terminal characteristics cannot be altered from the keyboard. The keyboard is locked out for the specified operation. The HEX code identifies a firmware bit which is set=1 in order to establish the desired condition. Multiple conditions may be established by using the appropriate HEX codes; however, all bits must be set at the same time.

HEX CODE	BIT SET=1	CONDITION
E01	0	Prevents FUNKEY programming from keyboard.
E04	3	Prevents keyboard programming of the function which inhibits Audio Video Turnoff.
E40	7	Prevents keyboard programming of personality changes.

- ESC. [F (HEX)] " establishes which visual attributes will be applied to the message which will be placed on Status Line 25 in response to an "ESC F" command (refer to paragraph 3.8.5). The two-character HEX character establishes the same video attributes described in paragraph 3.8.10, in accordance with the following:

  F00 Corresponds to ESC G0.

  F01 Corresponds to ESC G1.

  F02 Corresponds to ESC G2.

  F03 Corresponds to ESC G3.

  F04 Corresponds to ESC G4.

  F05 Corresponds to ESC G5.

  F06 Corresponds to ESC G6.

  F07 Corresponds to ESC G7.

3.8.5 Terminal/Mode Control Operations

Remote Keyboard Control

The ADM-42 keyboard can be disabled locally or disabled by a remote computer using the ASCII code associated with the following keystrokes:

ESC # Disables all keyboard operations.

ESC " Enables keyboard and restores keyboard control.

Disabling the keyboard (ESC #) protects the keyboard against inadvertent operation. "LOCK" is displayed in Status Line 25. Keyboard operation can be restored manually by pressing SHIFT/RESET momentarily.

ADM-1 Mode Control

Upon occasion it may be required that the ADM-42 operate as if it were an ADM-1 for certain transmissions. The ADM-1 Mode is entered by executing "ESC %" and terminated by executing "ESC $". When in effect, "ADM-1" is displayed in Status Line 25. The following changes are affected in ADM-42 transmission.

- The FS code is not transmitted between fields.
- The NEW LINE (US) code is not transmitted at the end of each line.
- The cursor goes to the first unprotected field on the screen when PROT MODE is set.

Status Control

The availability of four separate messages can be indicated by the displaying of status code S1, S2, S3, or S4, in Status Line 25. A blinking S4 indicates an important message is waiting. An escape sequence is required to call up the waiting message, as follows:

STATUS	S1	S2	S3	S4
ON	ESC c	ESC e	ESC g	ESC <
OFF	ESC b	ESC d	ESC f	ESC >

In addition to the above status message, an override message may be placed on Status Line 25 by means of a CPU initiated "ESC F" command. All status information displayed on line 25 will be overriden in favor of this message from the host. Any control character will terminate the writing of this message and/or display it in Status Line 25. PAGE FWD (ESC K) or MODES CLEAR (ESC Z) or anything affecting Status Line 25 will clear any status message.

"ESC Z" will clear all modes and operations which have been dynamically set into the terminal.

3.8.6 Cursor Control Operations

Control of the cursor can be initiated at the keyboard using a CTRL or ESC key sequence. The ESC sequence consists of pressing the ESC key followed by one or more alpha or special character keys. The CTRL operation consists of pressing an alpha character key while holding the CTRL key. When initiated, the operation causes the cursor to respond in the same manner as with the labeled operational control keys discussed in paragraph 3.3. (Also, the control code is transmitted during Conversation Mode transmission.) The coding is equivalent to that which the computer transmits to the terminal to control the cursor. Refer to table 3-3 for the list of cursor control codes and to figures 3-2 and 3-3 for the ASCII and HEX codings.

The cursor may be commanded to an absolute CRT screen position which can be defined in terms of its vertical (Y) and horizontal (X) coordinates. In the ADM-42, these coordinates are expressed by two ASCII (HEX) characters in conjunction with an escape sequence, with the vertical (Y) coordinates expressed first. Similarly, the absolute screen position of the cursor may be read by means of another escape sequence. When initiated, the sequence causes the appropriate cursor operation to be executed; the control code is transmitted in Conversation Mode.

Figure 3-4 shows the absolute X or Y position (1-80 horizontal; 1-24 vertical) and the ASCII (HEX) code assigned to each position. The following escape sequences are used to execute absolute cursor position operations:

- "ESC=(HEX)(HEX)" commands the cursor to the desired row (Y) and column (X) position on the current page.
- "ESC-[1(HEX 31) thru 8(HEX 38)](HEX)(HEX)" commands the cursor to the desired row (Y) and column (X) position on the selected page (1 thru 8).
- "ESC ?" reads the cursor row (Y) and column (X) position on the current page.
- "ESC/[1(HEX 31) thru 8(HEX 38)]" reads the cursor row (Y) and column position the selected page (1 thru 8).

Note

The absolute values indicated by (YX), above are the vertical/horizontal screen coordinates of the cursor position. In machine language, these coordinates are expressed by an ASCII (HEX) code which has been assigned to one of the 80 positions on a line (Y coordinate) or one of the 24 lines (X coordinate). See figure 3-4.

3.8.7 Format Control Operations

The operator can exercise control of the text format on the CRT screen from either the keyboard or the computer. At the keyboard, the operator uses the ESC or CTRL key in combination with alphanumeric or special character keys to establish the selected control sequences. These sequences are listed in table 3-3 and the appropriate ASCII and hex codings are shown in figure 3-2 and 3-3. Using the ESC key executes the selected operation, and causes the escape character and the ASCII character to be transmitted in Conversation Mode.

Several format control operations are available which provide great versatility in setting and using the terminal tabs, as follows:

Protect Mode Tabs

"ESC V" causes a vertical column of protected spaces to be set at the cursor position. The column extends from line containing cursor to line 24. Protect Mode is automatically set. Tabs may be cleared by terminating Protect Mode.

Typewriter Tab Mode Tabs

"ESC 3p" establishes Typewriter Tab Mode, during which tabs may be set and cleared in much the same way as an ordinary typewriter. Typewriter Tab Mode is not operative while Protect Mode is set; however, setting Protect Mode does not clear any typewriter tabs which have been set. Thus, while in Typewriter Tab Mode:

- "ESC 0" Clears all typewriter tabs.
- "ESC 1" Sets a vertical column of tabs at the cursor postion for the entire page.
- "ESC 2" Clears the vertical column of tabs at the cursor positon.
- "ESC 3 Space" Clears Typewriter Tab Mode.

Modulus Tabs

- "ESC 3 [HEX] " sets vertical columns of tabs on the current page at the position intervals specified by absolute (modulo) value represented by the [HEX] character. (See figure 3-4.) The double HEX byte defines an ASCII character which in turn expresses the number of positions in each tab interval. Thus, HEX 2F (ASCII /) calls for 15 positions between tabs.

- "ESC 3 Space" clears all Modulus Tabs.

3.8.8 Data Editing Control Operations

Data editing using escape sequences accomplishes essentially the same operations as those initiated by means of labeled special editing keys, as described in paragraph 3.4. Table 3-3 lists the previously described operations, as well as several which are available only via escape sequences. The escape-sequence operations take precedence over standard and dynamic personality attributes, unless otherwise specified. CLEAR and ERASE commands, apply only to the page currently being displayed, even if AUTO PAGE is set. The following escape sequences match the indicated special key operations:

- ESC E matches LINE INSERT.
- ESC J matches PAGE BACK.
- ESC K matches PAGE FWD.
- ESC N matches PAGE EDIT (ON).
- ESC O matches PAGE EDIT (OFF).
- ESC Q matches CHAR INSERT.
- ESC R matches LINE DELETE
- ESC T matches LINE ERASE.
- ESC W matches CHAR DELETE.
- ESC Y matches PAGE ERASE.
- ESC y matches SHIFT/PAGE erase.
- ESC t matches SHIFT/LINE erase.
- ESC ; matches CLEAR SPACE.
- ESC : matches CLEAR NULL.
- ESC + matches SHIFT/CLEAR SPACE.
- ESC * matches SHIFT/CLEAR NULL.

X or Y POSITION	MODULO NUMBER	ASCII CODE	HEX CODE	X or Y POSITION	MODULO NUMBER	ASCII CODE	HEX CODE
1	0	SPACE	20	41	40	H	48
2	1	!	21	42	41	I	49
3	2	"	22	43	42	J	4A
4	3	#	23	44	43	K	4B
5	4	$	24	45	44	L	4C
6	5	%	25	46	45	M	4D
7	6	&	26	47	46	N	4E
8	7	'	27	48	47	O	4F
9	8	(	28	49	48	P	50
10	9	)	29	50	49	Q	51
11	10	*	2A	51	50	R	52
12	11	+	2B	52	51	S	53
13	12	,	2C	53	52	T	54
14	13	-	2D	54	53	U	55
15	14	.	2E	55	54	V	56
16	15	/	2F	56	55	W	57
17	16	0	30	57	56	X	58
18	17	1	31	58	57	Y	59
19	18	2	32	59	58	Z	5A
20	19	3	33	60	59	[	5B
21	20	4	34	61	60	\	5C
22	21	5	35	62	61	]	5D
23	22	6	36	63	62	^	5E
24	23	7	37	64	63	_	5F
25	24	8	38	65	64	`	60
26	25	9	39	66	65	a	61
27	26	:	3A	67	66	b	62
28	27	;	3B	68	67	c	63
29	28	<	3C	69	68	d	64
30	29	=	3D	70	69	e	65
31	30	>	3E	71	70	f	66
32	31	?	3F	72	71	g	67
33	32	@	40	73	72	h	68
34	33	A	41	74	73	i	69
35	34	B	42	75	74	j	6A
36	35	C	43	76	75	k	6B
37	36	D	44	77	76	l	6C
38	37	E	45	78	77	m	6D
39	38	F	46	79	78	n	6E
40	39	G	47	80	79	o	6F

Figure 3-4. Chart of Absolute Cursor Positioning Codes and Modulo Numbers

The following data editing operations can be executed only using escape sequences:

- ESC L commands GO TO PG [N] , where [N] is a single page number 1 through 8.
- ESC m [(Y) (X)] writes a character a specific number of times, where (X) is the ASCII code for the desired character, and (Y) is a modulo character in accordance with figure 3-4.
- ESC q places INSM in Status Line 25 and sets INSERT MODE; ESC r clears INSERT MODE. INSERT MODE is a special case of CHAR INSERT here the character(s) may be inserted wherever desired without using the CHAR INSERT key.
- ESC, commands CLEAR ALL TO PROTECTED SPACES. Screen is cleared and replaced with protected spaces. If Protect Mode is now set, the last space on the screen is unprotected.

3.8.9 Data Transmission Control Operations

Data transmission using escape sequences is associated most directly with Block Mode transmission, and accomplishes essentially the same operations as those described in paragraphs 3.5 through 3.5.6. Table 3-3 lists all the data transmission operations available, some of which can be executed only via an excape sequence. The following escape sequences match the indicated special key operations:

- ESC 4 matches SEND LINE (unshifted).
- ESC 5 matches SEND PAGE (unshifted).
- ESC 6 matches SHIFT/SEND LINE.
- ESC 7 matches SHIFT/SEND PAGE.
- ESC B matches CONV MODE (OFF).
- ESC C matches CONV MODE (ON).
- ESC S matches SEND MSG.
- ESC p matches SHIFT/PRINT.
- ESC s matches SHIFT/SEND MSG.

The following data transmission operations can be executed only through escape sequences:

- ESC DH sets Conversation Mode Half Duplex and ESC DF sets Conversation Mode Full Duplex operation.

- ESC a 0 commands AUX CTRL OFF, and ESC a 1 commands AUX CTRL ON. These commands disable and enable RCVE data communication through the ASYNC PRINTER interface port.

- ESC @ causes all unprotected data on a page to be sent to the printer, with protected data sent as spaces. Trailing spaces or nulls are not transmitted, and attribute control codes are transmitted as spaces.

- ESC / causes the page number (1 thru 8), then the YX coordinates of the cursor position on the current page to be read out to the computer.

- ESC ? causes the YX coordinates of the cursor position on the displayed page to be read out to the computer.

- ESC [(*) establishes the Buffered Print Control Mode in which different printing characteristics are expressed by the (*) characters selected, as follows:

  (OP) Calls for unbuffered serial printing; the same as using the PRINT key with the serial interface enabled.

  (1P) Calls for unbuffered parallel printing; the same as using the PRINT key with the parallel interface enabled.

  (2P) Causes current page data to be sent to the printer buffer (last page of display memory), then from the buffer to the serial printer at printer speed. Data will be lost if the buffer overflows.

Note

Status Line 25 in the print buffer can be affected by data entered during Buffered Print Mode.

(3P) Causes data to be written into and read out of the printer buffer as described for (2P), except that the printer is a parallel printer.

(0p) Calls for unbuffered serial printing of unformatted data; the same as SHIFT/PRINT key with the serial interface enabled.

(1p) Calls for unbuffered parallel printing of unformatted data; the same as SHIFT/PRINT key with the parallel interface enabled.

(2p) Causes unformatted data to be written into and out of the printer buffer as described for (2P).

(3p) Causes unformatted data to be written into and out of the printer buffer as described for (2P), except that the printer is a parallel printer.

- CTRL T/t terminates Buffered Print Control Mode; however, printing from the buffer continues until buffer is empty.

- ESC : [*] Changes dynamically the MODEM and/or ASYNC PRNTR baud rates established by the configuration control switches. Terminated by "ESC Z", the baud rate values are determined by the character selected for [*] , in accordance with table 3-4.

3.8.10 Video Attribute Control

The visual (video) attributes of the ADM-42 are generally established by the equipment design and the installation settings of SW 1 thru SW 4 of the configuration control switch bank (eight two-position switches) at switch location 1B on the standard PCBA. These attributes are as follows:

- SW 1 ON enables the blanking of specified fields; SW 1 OFF enables the underlining of specified fields.

- SW 2 ON enables the displaying of ADM-42 attribute (when called for by an escape sequences) as codes; SW 2 OFF enables displaying the attributes as spaces.

- SW 3 ON disables the Graphic Mode attribute; SW 3 OFF enables the Graphic Mode attribute (future).

- SW 4 determines whether ADM-42 nulls will be displayed as null codes (ON) or space codes (OFF).

Table 3-4. Dynamic Baud Rate Codes

SW POSITION	BAUD RATE	ASCII CHARACTER	
		MODEM PORT	ASYNC PRNTR PORT
0	50	@	--
1	75	A	a
2	110	B	b
3	134.5	C	c
4	150	D	d
5	300	E	e
6	600	F	f
7	1,200	G	g
8	1,800	H	h
9	2,000	I	i
10	2,400	J	j
11	3,600	K	k
12	4,800	L	l
13	7,200	M	m
14	9,600	N	n

Certain video attributes can be temporarily (dynamically) modified using escape sequences. The selected modification will be only to the end of the line containing the changed attribute. If power is turned off, the video attributes revert to their standard configuration. Dynamically establishing or changing these attributes is accomplished by executing "ESC G", followed by a character 0 thru 7. The attribute change is executed and the escape sequence is written for transmission to the computer. The following video attributes can be established or altered by the escape sequences indicated below. "ESC G0 terminates the attribute escape sequence being changed.

- ESC G0 Reset to standard video. Used in conjunction with other video escape sequences to establish the limits of the video field being changed.
- ESC G1 Designated area is underlined or blanked (depending upon SW 1 position) in the display.
- ESC G2 Designated area blinks in the display.
- ESC G3 Designated area is underlined or blinks (depending upon SW 1 position) in the display.
- ESC G4 Designated area is reversed.
- ESC G5 Designated area is reversed and underlined or blanked (depending upon SW 1 position).
- ESC G6 Designated area is reversed and blinking.
- ESC G7 Designated area is reversed and underlined or blanked (depending upon SW 1 position).

3.9 STANDARD (ADM-2) POLLING

When the Polling Option is installed in the ADM-42, the terminal may then act as an ADM-2 compatible polling terminal in a multi point communications network. Group Poll, Group Select, and Multi-Point Contention polling activities are also available. When active in a Polling environment, the ADM-42 is prevented from initiating transmission of traffic (data) except under the control of the network control center. All message transmission is between the network control center and the selected terminal or terminals; these messages, as well as control of the entire communications network, are controlled entirely by a polling/addressing dialogue initiated by the control center. Within the dialogue, the control center periodically asks or "polls" each device to see if any messages are waiting; if so, the device is commanded to transmit its message in a prescribed format. The control center may also send messages to a specified terminal or terminals at any time.

3.9.1 Setting ADM-42 Address

The ADM-42 Polling Address is a two-character code (A_1A_2) which is part of the Polling Header. Both address characters must be ASCII characters; however, both characters may be identical. The terminal will recognize and respond to only the specified address. The address is preset by means of two banks of DIP switches (locations 5L and 6L) on the Option PCBA (see figure 1-6). Each switch in the bank represents one bit in the 7-bit address: SW 1 OFF sets bit 1 (LSB) = 1; SW 2 OFF sets bit 2 = 1; etc. SW 8 (location 5L only) ON enables Polling activities. SW 8 ON at location 6L enables the Polling Communications Buffer. The present switch settings establish the Polling Address for the ADM-42. This address may be displayed by keying "ESC ^A" from the keyboard. Operating any key will terminate the display.

3.9.2 Standard (ADM-2) Polling Operations

Setting Up Terminal

The information to be transmitted when the terminal is polled must be entered on the ADM-42 display prior to being polled. Proceed as follows:

1. Press CONV MODE to lighted state, to enable data entry from the keyboard.

Note

This requirement may be dynamically altered by means of an escape sequence as described in paragraph 3.8.4.

2. Enter the data just as it is to be transmitted. All editing and embedding of control characters must be done at this time.

Note

Function keys F1 thru F16 can be used to transmit the SOH code or a preset message when the terminal is polled. Refer to paragraph 3.8.3 and enter the desired message or ASCII character under FUNKEY F1 thru F16 at this point.

3. Select and execute the appropriate SEND activity to enable the ADM-42 response to a POLL inquiry, as follows:

- SEND LINE, to cause the ADM-42 to send all unprotected characters from the beginning of the line through the cursor position. To send protected as well as unprotected characters, press SHIFT/SEND LINE. This operation is the same as the forced SEND, v (unshifted) or send, x (shifted) from the computer.

Note

Executing an escape sequence as described in paragraph 3.8.4 will inhibit transmission of the character position under the cursor.

- SEND PAGE, to cause the ADM-42 to send all unprotected characters from the beginning of the page through the cursor position. To send protected, as well as unprotected characters, press SHIFT/SEND PAGE. This operation is the same as the forced SEND, w (unshifted) or SEND, y (shifted) from the computer.

Note

Executing an escape sequence as described in paragraph 3.8.4 will inhibit transmission of the character position under the cursor.

- SEND MSG, to cause the ADM-42 to send all unprotected characters in the display bracketed by SOM (STX) and EOM (ETX) codes. If no STX is encountered, transmission will start at the HOME position; if no ETX is encountered, transmission will stop at the end of the page. To send protected, as well as unprotected characters, press SHIFT/SEND MSG. This operation is the same as the forced SEND, z (unshifted) or SEND, { (shifted) from the computer.

The terminal is now ready to transmit. It waits to be polled. (The CONV MODE light is out).

ADM-1 Mode Operation

When the ADM-42 is in the ADM-1 Mode (ESC %) the transmission of text is modified as follows:

1. The FS characters indicating the presence of protected fields are not sent.

2. The US characters indicating the end of line are not sent.

3. When the SEND key is operated, the CONV MODE light will go out and the operator will no longer have control. To regain control prior to being polled, press SHIFT/RESET to return the ADM-42 to the IDLE state.

Monitor Mode Operation

The ADM-42 may be set up for Monitor Mode operation by executing an "ESC ` M" sequence from the keyboard. This operation causes all data (including line control data) on the RCVE line to be displayed, whether addressed to this terminal or not. This mode is usually employed as a troubleshooting activity. Monitor Mode is reset by executing SHIFT/RESET from the keyboard or by an unconditional from the remote computer.

3.9.3 Removing Terminal from Standard Polling Status

Enabling Keyboard

To enable the ADM-42 keyboard for data entry, press the CONV MODE key to its lighted state, or enter "ESC C" from the keyboard. If either of these operations does not return the terminal to keyboard operation, press SHIFT/RESET. The lighted CONV MODE key indicates when control has been returned to the keyboard. The computer can override local keyboard operation by executing FAST SELECT, or BROADCAST SELECT, if the ADM-42 has been designated as a Broadcast Select Terminal.

Resetting Standard Polling Mode

To set Standard Mode, execute "ESC ` R" from the keyboard. The ADM-42 will no longer respond as a polling terminal. To re-establish Polling Mode, execute "ESC ` S" from the keyboard. Polling Mode may also be disabled by setting DIP switch 8 at locations 5L and 6L on the Option PCBA to OFF.

3.9.4 Initiating Standard Polling Sequence

All polling operations are initiated by the network control center through a standard control sequence. This sequence consists of the following:

1. EOT Character (EOT)

2. Two Address Characters (A_1A_2). In order for the terminal to respond, these characters must match the two address characters established by the DIP switches.

3. A Function Code. This code is an ASCII character, used to identify the transmit operation to be performed by the terminal. It may be one of the following:

p	POLL	v	SEND LINE FOREGROUND
q	SELECT	w	SEND PAGE FOREGROUND
r	SEQUENTIAL SELECT	x	SEND LINE ALL
s	FAST SELECT	y	SEND PAGE ALL
t	BROADCAST SELECT	z	SEND MSG FOREGROUND
		{	SEND MSG ALL

4. ENQ Character (ENQ). This character is present only when a POLL (p), SELECT (q), or SEND (v, w, x, y, z, {) operation is called for.

3.9.5 Standard (ADM-2 Compatible) Responses

POLL Responses (See figure 3-5.)

The POLL sequence is initiated by the control center to let the ADM-42 know that the computer is available to receive messages. When the ADM-42 is addressed by the sequence "EOT A_1A_2 p ENQ" the terminal responds as follows:

1. If there is no message waiting to be sent (traffic), the terminal sends an EOT character to the control center and then returns to the IDLE state.

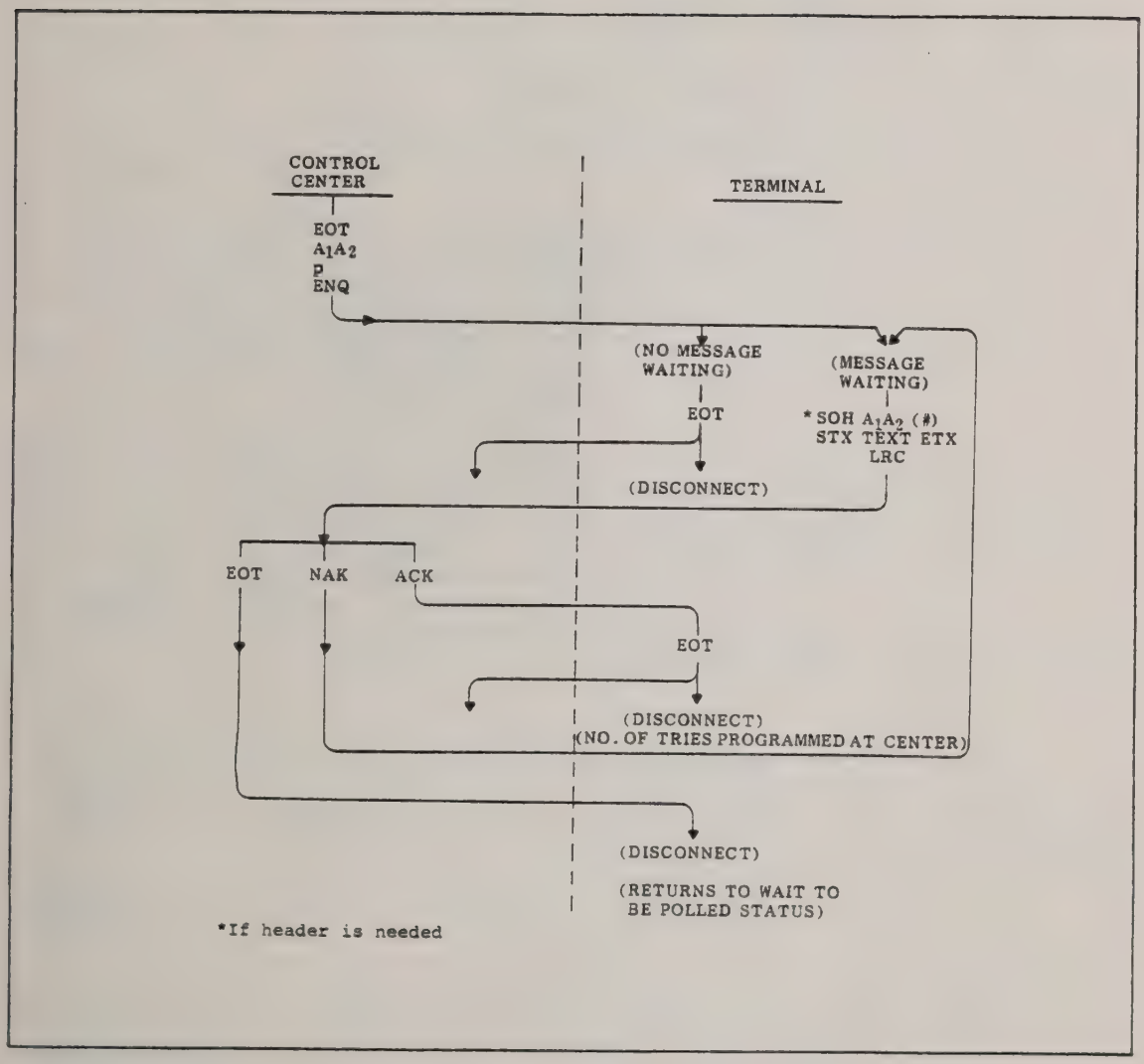


Figure 3-5. POLL Function Dialogue, Flow Diagram

2. If there is traffic, the terminal sends the message to the control center in accordance with how the message is prepared, the instructions in the Function Code, and the personality of the terminal.

   a. If the Polling message is to be taken from the display screen or a programmed FUNKEY, the terminal response is as follows:

      - *SOH Character (SOH).
      - *Two Address Characters (A_1A_2). These characters are the preset terminal address.
      - *Transmission Number (#). This number may be inhibited (by means of an "ESC.C00" sequence) and thus not appear. If enabled, the maximum number of transmissions counted (re-transmissions are not counted) may be between 1 and 9, depending upon the personality selection (refer to paragraph 3.8.4).
      - STX Character (STX). This character identifies the beginning of the message to be transmitted.
      - Text. This is the message which is written on the screen or stored under a FUNKEY. The message is sent in one of two formats, depending on whether or not Protect Mode is set at the terminal, as follows:

        a. Protect Mode Off. All foreground (unprotected) characters except NUL are sent. A US character is inserted in the string as the cursor moves from the end of one line to the beginning of the next.

        b. Protect Mode On. All foreground characters are sent; each protected field is designated by an FS character.

        If the Function Code is a SEND code (v,w,x,y, z, or {) instead of "p" the terminal complies with the instruction as described under SEND Responses, below.

      - ETX Character (ETX). This character designals the end of the polled message.

*If header is needed.

- LRC Character (LRC). This character represents the modulo 2 sum of the text transmitted, plus the ETX character. It is used by the control center to determine whether or not the text was received correctly.

b. If the polling message is to be taken from an unprogrammed FUNKEY (F1 through F16) and headers are not required, the terminal responds: "SOH (character) ETX LRC". Note that "SOH" replaces the normal STX character and the (character) is the assigned FUNKEY character.

c. If the polling message is to be taken from an unprogrammed FUNKEY (F1 through F16) and headers are required, the terminal responds: "SOH A_1A_2 (#) STX DLE (character) ETX LRC". Note that DLE (or some character other than SOH, STX, EOT, ETX, or LRC) replaces the normal SOH FUNKEY character.

3. After the ADM-42 has sent the LRC character, it positions the cursor at the original location and waits for the control center to acknowledge receipt of the message. The acknowledgement will consist of one of the following:

- ACK. The message was received correctly. The terminal will respond by transmitting "EOT" and disconnecting.

- NAK. The message was received with errors. The terminal will respond by retransmitting the message (transmission number is not incremented) and again waiting for control center acknowledgement. The control center will determine how many transmissions will be called for.

- EOT. Retransmission is required. The terminal responds by positioning the cursor at the original location and awaiting polling.

SELECT Responses (See figure 3-6).

The SELECT sequence is used when the control center wishes to send a message to a single addressed terminal. When the ADM-42 is addressed by the sequence "EOT A_1A_2 q ENQ", the terminal responds as follows:

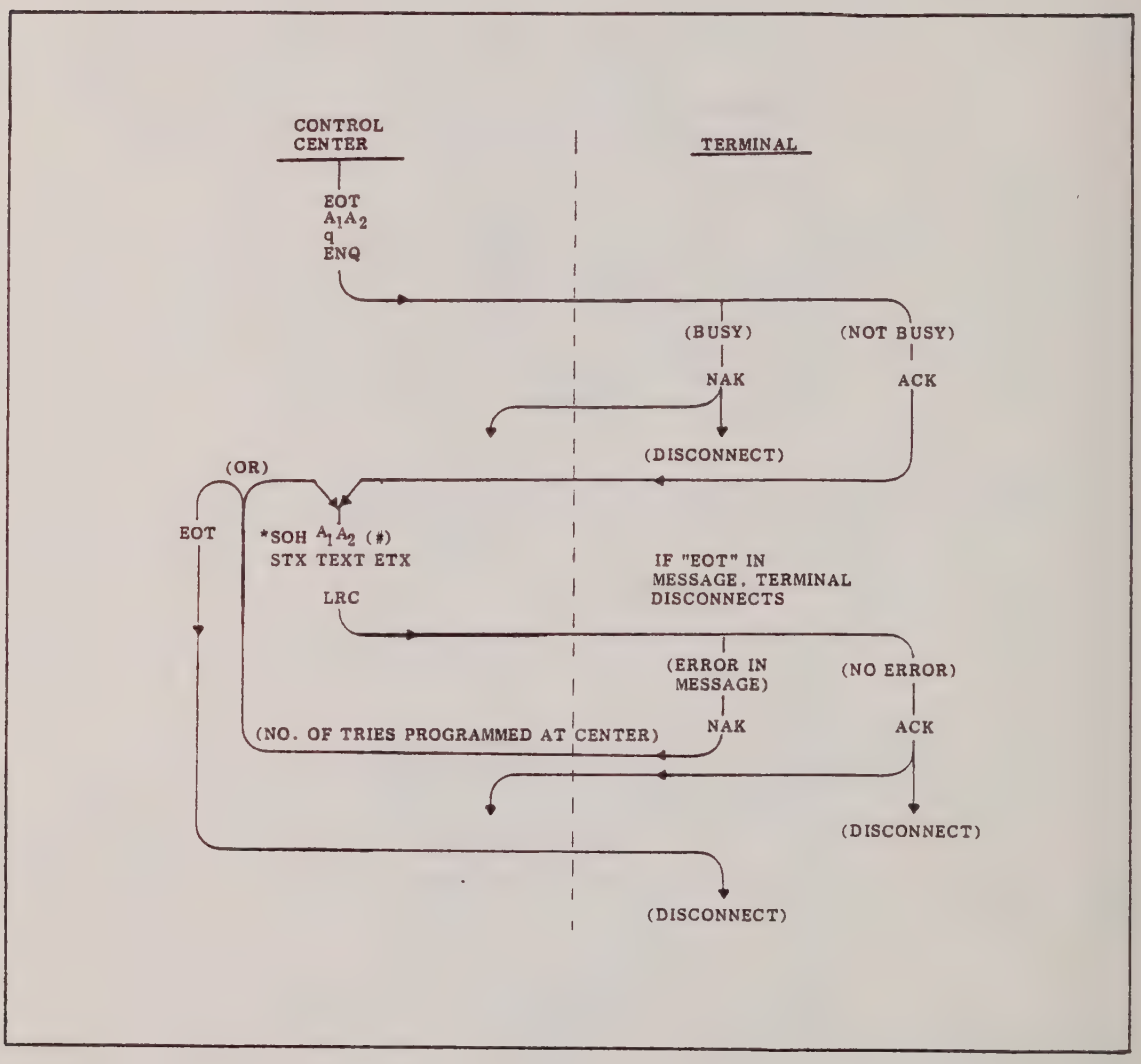


Figure 3-6. SELECT Function Dialogue, Flow Diagram

1. If the terminal is BUSY, it sends character NAK, beeps to alert the operator that a message is waiting, then disconnects. BUSY is defined as any of the following states:

   - The terminal is waiting to be polled.
   - The operator is entering data.
   - The terminal is sending data to the printer.

2. If the terminal is not BUSY, it sends character ACK to the control center, and waits for the center to send "SOH A_1A_2 (#) STX TEXT ETX LRC". If there is an EOT in the message, terminal will disconnect to IDLE state.

3. After the selected header is received, the following events occur:

   - If there are no errors, the ADM-42 sends character ACK to the control center, then disconnects to the IDLE or personality state.
   - If there are errors, the ADM-42 sends character NAK to the control center and awaits retransmission of the message.
   - The control center may then retransmit the message, starting with the selected header. If the control center decides not to retransmit, it sends character EOT instead of the selected header; the ADM-42 disconnects to the IDLE state.

SEQUENTIAL SELECT Responses (See figure 3-7.)

The SEQUENTIAL SELECT operation is used to sequentially address a number of terminals with a single extended control message. The header sequence is "EOT A_1A_2 r B_1B_2 r....N_1N_2 s". Note that the FAST SELECT (s) Function Code is sent to the last terminal addressed. This code is always followed by "SOH N_1N_2 (#) STX Text ETX LRC". The following events take place:

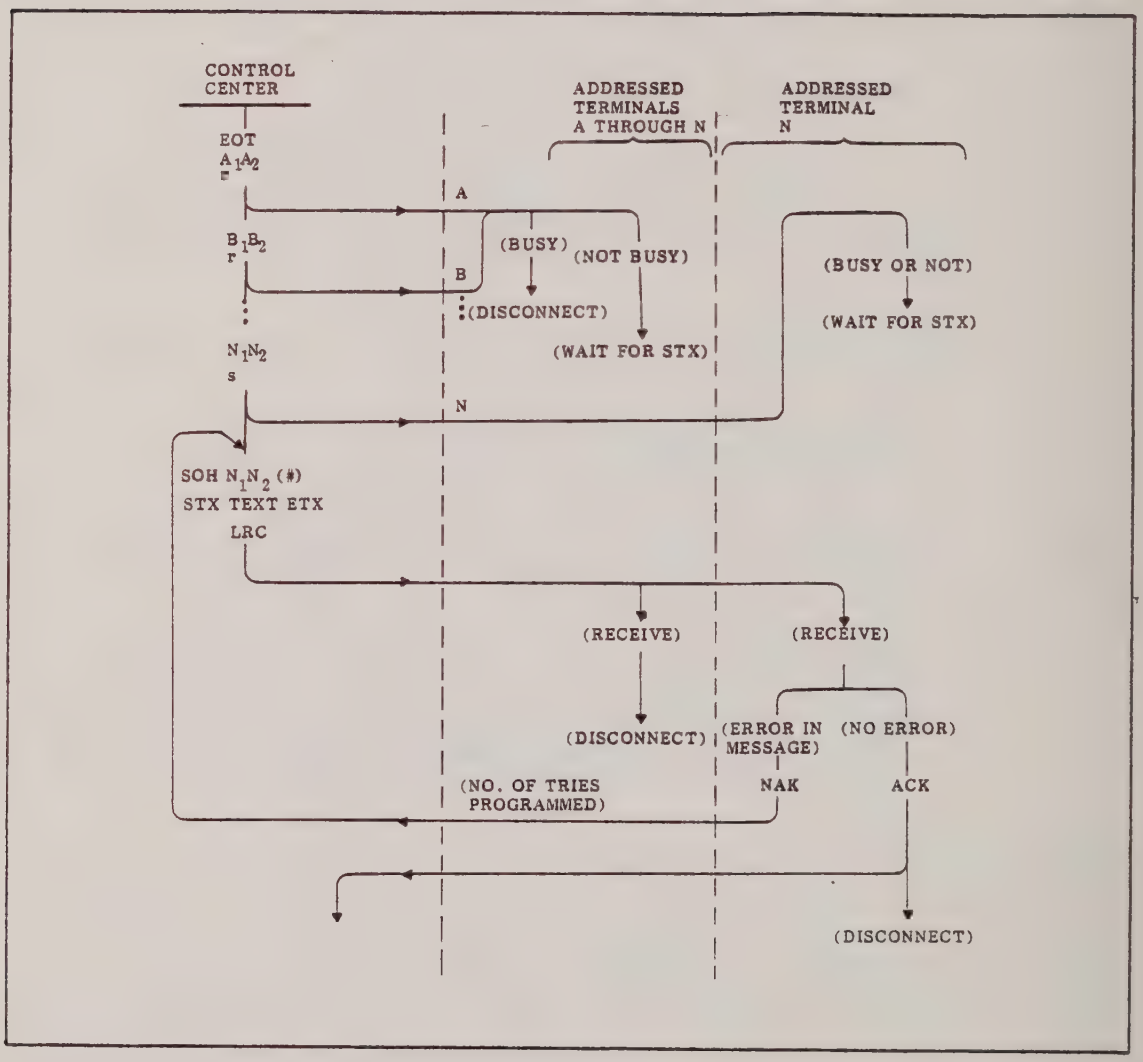


Figure 3-7. SEQUENTIAL SELECT Function Dialogue, Flow Diagram

1. All terminals except the last terminal (N_1N_2) test their BUSY status. If BUSY, each terminal will disconnect without responding.

2. Last terminal (N_1N_2) connects unconditionally and waits for an STX character. Any other terminal which is not BUSY connects and waits for an STX character.

3. Following receipt of "...ETX LRC" all addressed terminals except last terminal (N_1N_2) disconnect without responding. Terminal N_1N_2 sends either character ACK or NAK to the control center, then disconnects to IDLE or personality state. The control center decides whether or not to retransmit if NAK is returned.

FAST SELECT Responses (See figure 3-8)

The FAST SELECT function is used when the control center requires fast, unconditional (see note) selection of a specific terminal. Upon receiving the header sequence (EOT N_1N_2 s), the terminal will unconditionally connect and wait for the message block. The terminal will not respond until after it has received the LRC character. The complete message block code is "SOH N_1N_2 (#) STX Text ETX LRC". After receiving LRC, the terminal sends either ACK or NAK to the control center, then disconnects to IDLE (or personality) state. The control center decides whether or not to retransmit if NAK is returned.

Note

Acceptance of FAST SELECT may be made conditional by executing an escape sequence as described in paragraph 3.8.4.

BROADCAST SELECT Responses (See figure 3-9.)

The BROADCAST SELECT function is used when the control center requires fast, unconditonal selection of a number of terminals. All terminals on the line receive the same message under the header sequence. When each terminal receives the sequence "EOT N_1N_2 t" followed by "SOH N_1N_2 (#) STX Text ETX LRC" *it will connect unconditionally*, whether BUSY or not. Following receipt of the sequence, all terminals except the addressed terminal disconnect to the IDLE (or personality) state without responding. The addressed terminal will send either ACK or NAK to the control center, then disconnect to the IDLE (or personality) state. The control center decides whether or not to retransmit if NAK is returned.

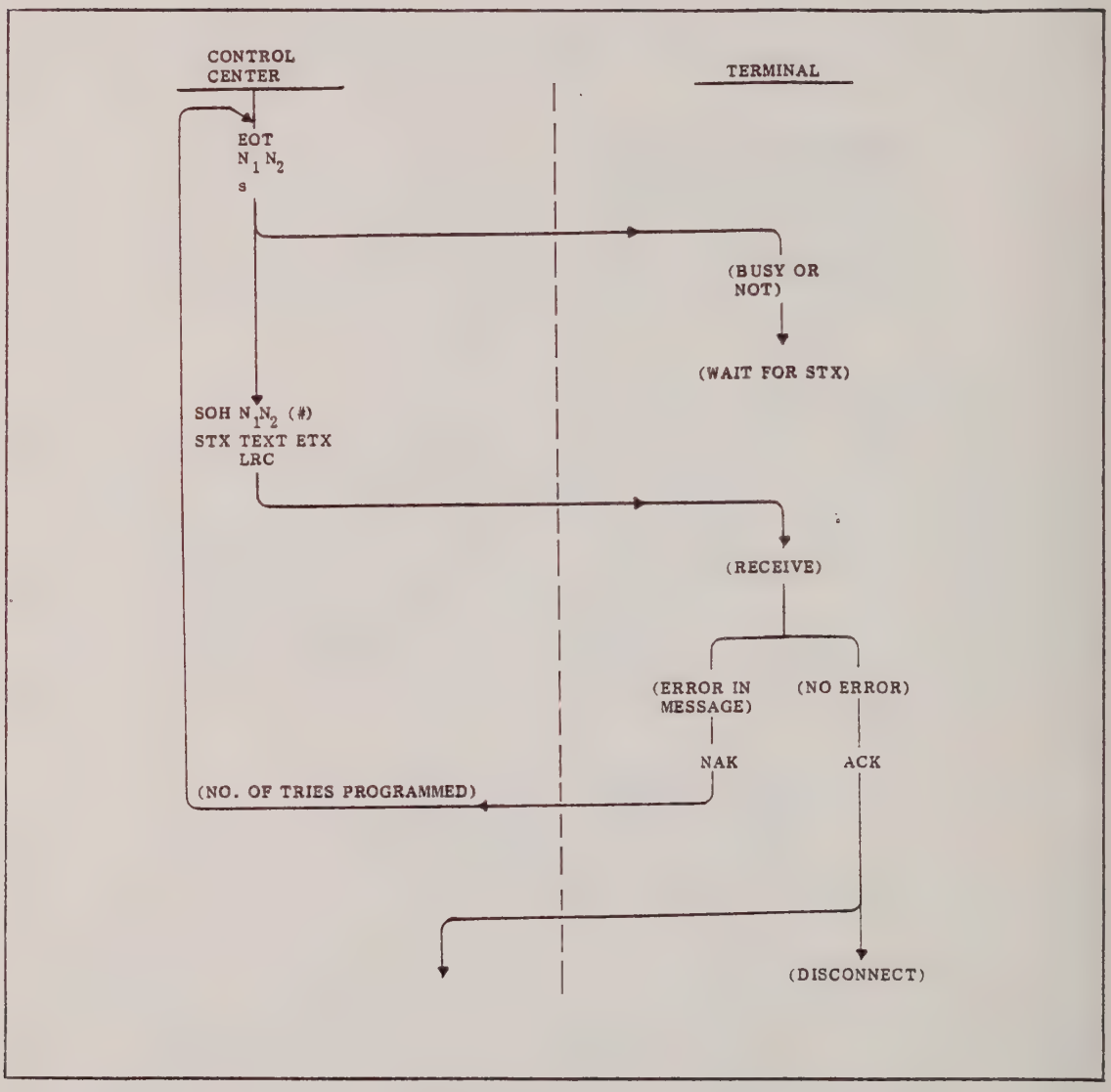


Figure 3-8. FAST SELECT Function Dialogue, Flow Diagram

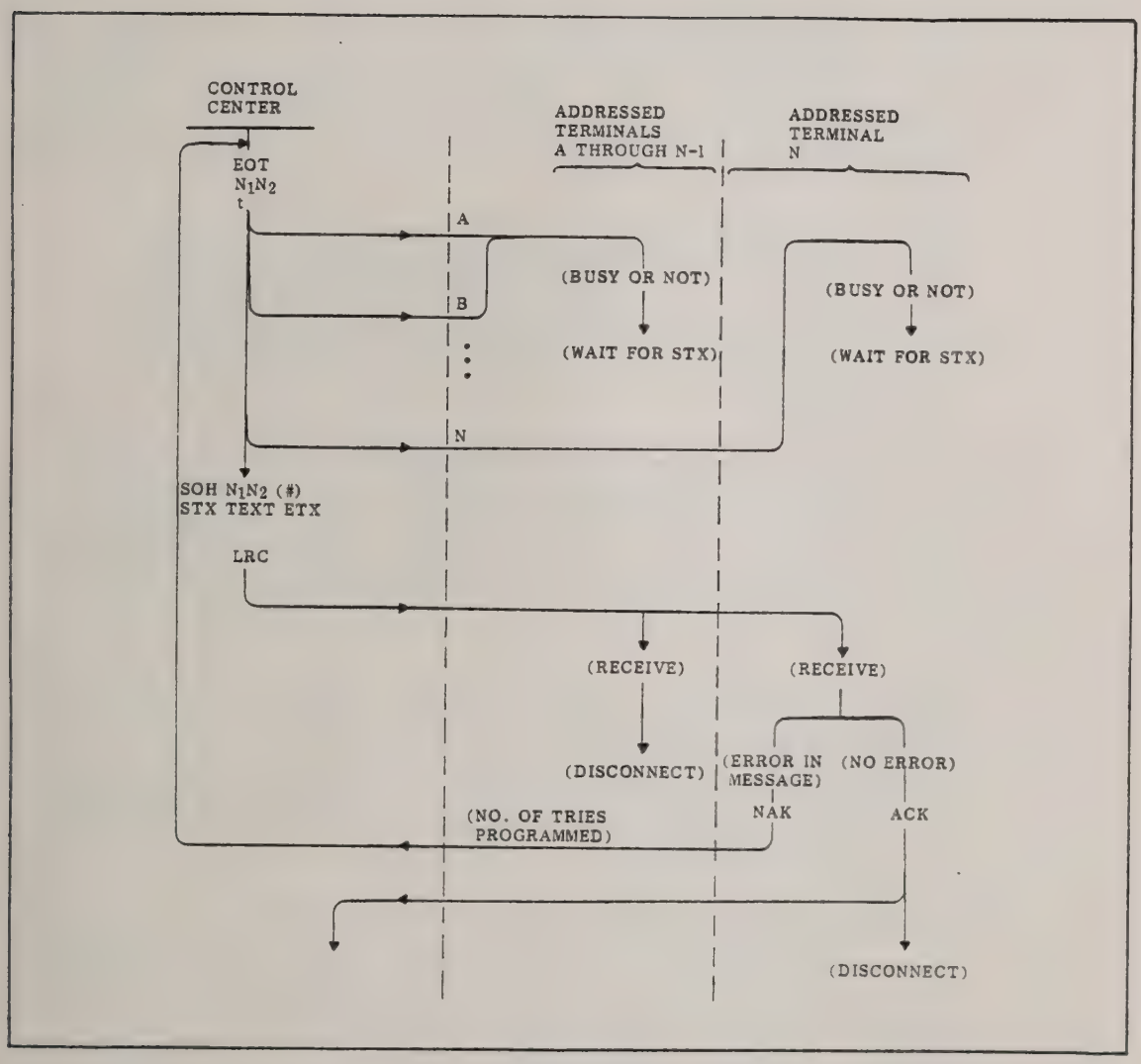


Figure 3-9. BROADCAST SELECT Function Dialogue, Flow Diagram

SEND Response (See figure 3-10.)

One of six characters specifies the information that the addressed terminal is to send. The function character (v, w, x, y, z, or {) is transmitted in place of the "q" in the standard header. The six possible SEND functions are as follows:

1. Send Line Foreground (v). The terminal will send all foreground unprotected data in the line in which the cursor rests from beginning of line to the cursor position. NUL characters are not transmitted. The terminal marks each protected area in the line by sending an FS character.

2. Send Page Foreground (w). The terminal will send all foreground data in the page, starting at the HOME location and ending at cursor position. NUL characters are not transmitted. The terminal marks each protected area in the page by sending an FS character. Each end of line is indicated by US character.

3. Send Line All (x). The terminal will send all data, protected and unprotected, in the line in which the cursor rests and stops at cursor. All characters are transmitted, with the sequence [ESC)] preceding the first character of a protected field, and the sequence [ESC (] following the last character of a protected field.

4. Send Page All (y). The terminal will send all data, protected and unprotected, in the page, beginning at the HOME location and stops at cursor. All characters are transmitted, with the sequence [ESC)] preceding the first character of a protected field, and the sequence [ESC (] following the last character of a protected field.

5. Send Message Foreground (z). The terminal will send all foreground data following an STX code and ending with an ETX code. NUL characters are not transmitted. The terminal marks each protected area within the STX/ETX brackets by sending an FS character. If no STX is on the screen, transmission starts at HOME. If no ETX is on the screen, transmission stops at last position on the screen.

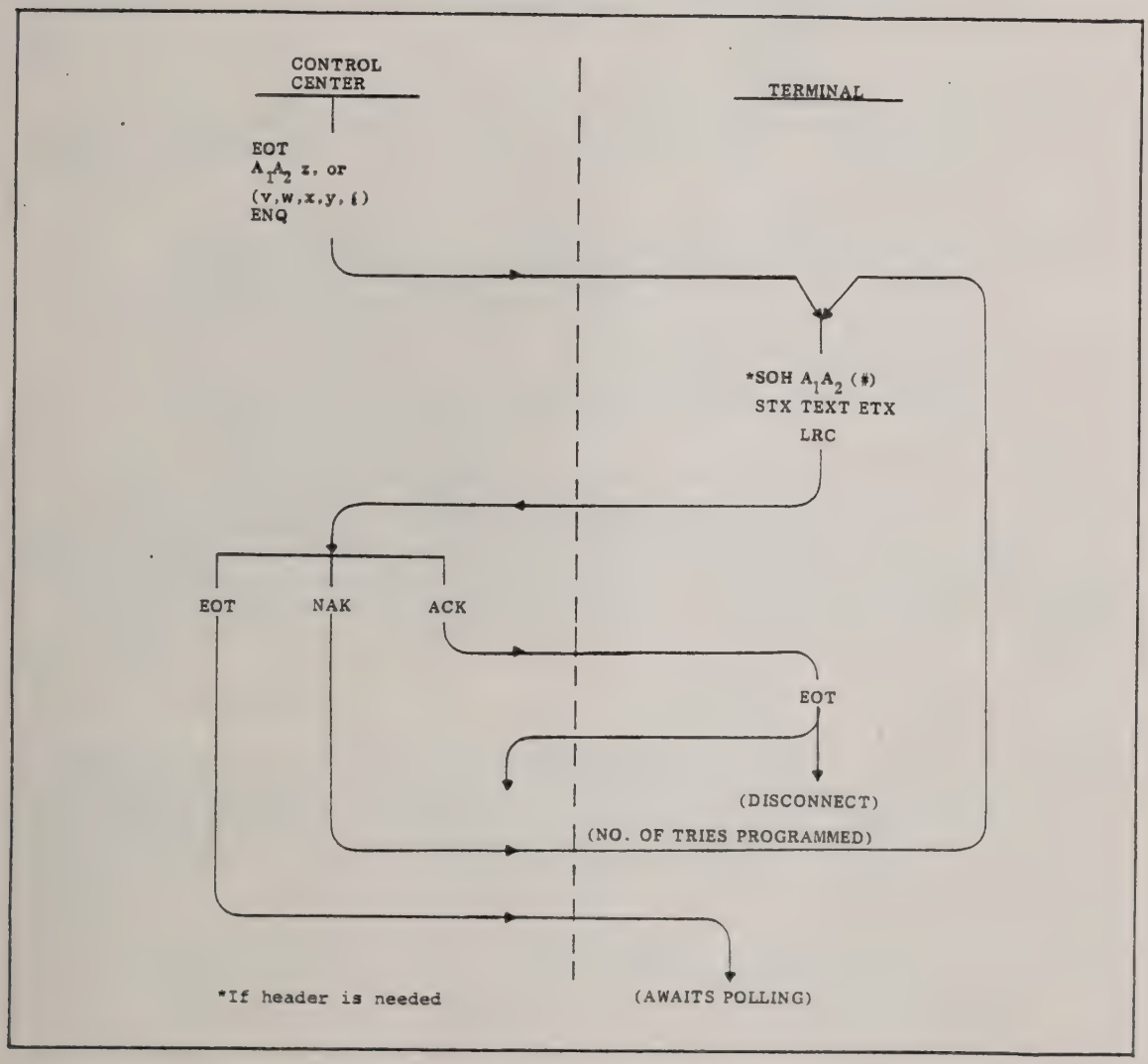


Figure 3-10. SEND Function Dialogue, Flow Diagram

6. Send Message All ({). The terminal will send all data, protected and unprotected, between the STX/ETX codes. All characters are transmitted, with the sequence [ESC)] preceding the first character of a protected field, and the sequence [ESC (] after the last character of a protected field. If no STX is on the screen, transmission starts at HOME. If no ETX is on the screen, transmission stops at the last position on the screen.

   The STX and ETX characters are entered on the screen by use of the SOM and EOM keys with and without shift, respectively.

   In standard (ADM-2 compatible) operation, control codes may be written by preceding the control code by ESC; i.e. (ESC Return) will cause the CR character to be written to the screen rather than being interpreted as a Return Operation.

3.10 SPECIAL POLLING OPERATIONS

In addition to acting as an ADM-2 compatible terminal, the ADM-42, with the Polling Option installed, may perform in several special polling environments. These environments consist of GROUP POLL, GROUP SELECT, MULTI-POINT CONTENTION, and PRINTER SELECT operation. The paragraphs which follow describe these operations in terms of their differences from standard (ADM-2 compatible) polling operations.

3.10.1 GROUP POLL Operations

GROUP POLL is essentially the same as standard ADM-2 compatible POLL operations, except that the terminal address is the same for each terminal in the group. All terminals are daisychained via their EXTENSION/MODEM ports. Each terminal responds as would an individual terminal under standard POLL. The GROUP POLL address for each terminal on the line is set up using the two banks of DIP switches at locations 8L and 9L on the Option PCBA in the same manner as for standard POLL (using switch locations 5L and 6L). Keying "ESC`A" from the keyboard will display all Polling addresses.

3.10.2 GROUP SELECT Operations

GROUP SELECT is essentially the same as standard ADM-2 compatible BROADCAST SELECT operations, except that the GROUP SELECT address (G_a) is inserted in the header in place of the "t". The complete address thus becomes: "EOT N_1N_2 G_a SOH N_1N_2 (#) STX TEXT ETX LRC". (G_a is an upper case alpha character, a to z.) Also:

1. The GROUP SELECT address requires only one bank of DIP switches, at location 11L on the Option PCBA, to be established.

2. Several groups may be selected by means of different terminal addresses. Every terminal in a group must be on the same line, but the line does not have physical limitations.

3. All terminals on line will connect unconditionally, with the addressed terminal responding as specified for BROADCAST SELECT.

3.10.3 MULTI-POINT CONTENTION Operations

MULTI-POINT CONTENTION is a polling mode which is selectable only by the control center, using the following control characters: "EOT NULL NULL BEL". In this mode, the control center CPU notifies all terminals (on the line that the CPU will not poll until it has a message to be sent or until a polling terminal signifies that it has a message for the CPU.

3.10.4 Addressable Printer Port Operations

The Addressable Printer Port operations are used to enable the ADM-42 to receive CPU output messages at the selected transmission rate, store the message, and retransmit the message in the prescribed format to a printer. The operation is as follows:

1. With the ADM-42 set up for standard polling, the control center calls for SELECT, as follows: "EOT A_1A_3 q ENQ". Note that the second terminal address (A_2) is incremented to A_3; this causes the ADM-42 to enable the print buffer (highest page) for operation. A buffer-not-empty condition will cause a terminal BUSY response.

2. The terminal responds to SELECT in the same manner as described in paragraph 3.9.5. Also a NAK may be sent upon completion of a message not only because of an incorrect LRC, or terminal BUSY; a printer buffer overflow will also cause the entire message to "NAK".

3. Once the terminal responds to the message with an "ACK" the ADM-42 disconnects, returns to the polling IDLE state, and begins outputting to the printer. Printing proceeds at the baud rate determined by the PRINTER BAUD RATE switch on the front panel, and continues until the buffer is empty. The terminal operates in Serial Buffered Print Mode (refer to paragraph 3.9.9) unless an "ESC [(*)]" sequence has established a different print mode (as determined by the *).

4. Once printing from the buffer begins, no further messages from the control center may be received by the print buffer until the buffer is empty. (The terminal responds BUSY only to a print message.)

APPENDIX A
OPERATOR'S QUICK REFERENCE GUIDES

OPERATOR'S QUICK REFERENCE GUIDE TO BAUD RATE CHANGE

Keys Used: ESC:[ASCII Character]

SWITCH POSITION	BAUD RATE	MODEM PORT		ASYNC PRNTR PORT	
		(KEYBOARD) ASCII	(REMOTE) HEX CODE	ASCII	HEX CODE
0	50	@	40	--	--
1	75	A	41	a	61
2	110	B	42	b	62
3	134.5	C	43	c	63
4	150	D	44	d	64
5	300	E	45	e	65
6	600	F	46	f	66
7	1200	G	47	g	67
8	1800	H	48	h	68
9	2000	I	49	i	69
10	2400	J	4A	j	6A
11	3600	K	4B	k	6B
12	4800	L	4C	l	6C
13	7200	M	4D	m	6D
14	9600	N	4E	n	6E

OPERATOR'S QUICK REFERENCE GUIDE TO PERSONALITY CHANGE

Keys Used: ESC. (FUNCTION CODE) (NEW CHAR)

FUNCTION	FUNCTION CODE (KEYBD) ASCII	FUNCTION CODE (REMOTE) HEX	NEW CHARACTER OR HEX NUMBER
Escape Leadin Character	0	30	
End Block Character	1	31	
2nd End Block Character	2	32	Enter HEX code associated with desired ASCII character.
New Line Character	3	33	
2nd New Line Character	4	34	
Field Separator Character	5	35	
Function Leadin Character	6	36	
Parity Leadin Character	7	37	
Clear Screen Character	8	38	
RTS Delay Character	9	39	HEX number (not code) X2= delay in ms.
Not Used	A	41	__ HEX CODE
Polling Option Variant	B	42	01= Headers required in address 02= Any key to initiate POLLING 04= Remote POLLING command is conditional 08= Return LOCAL after receive 10= Last character not transmitted 20= Print buffer enabled 40= Communications buffer enabled
Polling Transmission Number	C	43	Dec.No. 00= Transmission number inhibited (default) 01 to 09= Number of transmissions before recycle
Power-Up Default Modulus Tabs	D	44	Enter number corresponding to desired tab positions on page

OPERATOR'S QUICK REFERENCE GUIDE TO PERSONALITY CHANGE (cont'd)

FUNCTION	FUNCTION CODE ASCII	FUNCTION CODE HEX	NEW CHARACTER OR HEX NUMBER
Inhibit Dynamic change of Characteristic	E	45	HEX CODE 01= Inhibit FUNKEY programming. 04= Inhibit Auto Video Turn off. 40= Inhibit Personality Programming.
Video Attribute to Status Line 25	F	46	00= Reset to standard video 01= Underline or blank 02= Blink 03= Underline or blink 04= Reverse 05= Reverse and underline or blank 06= Reverse and blink

20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
space	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
30	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	51	52	53	44	55	56	57	58	59	5A	5B	5C	5D	5E	5F
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
'	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	71	72	73	74	75	76	77	78	79	7A	7B	7C	7D	7E	7F
p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	DEL

OPERATOR'S QUICK REFERENCE GUIDE TO

VIDEO ATTRIBUTE CONTROL SEQUENCE

FUNCTION	ESCAPE CODE
RESET TO STANDARD VIDEO	ESC G0
UNDERLINING OR BLANKING OF DESIGNATED AREA	ESC G1
BLINKING OF DESIGNATED AREA	ESC G2
UNDERLINING OR BLINKING OF DESIGNATED AREA	ESC G3
REVERSING OF DESIGNATED AREA	ESC G4
REVERSING AND UNDERLINING OR BLANKING OF DESIGNATED AREA	ESC G5
REVERSING AND BLINKING OF DESIGNATED AREA	ESC G6
REVERSING AND UNDERLINING OR BLINKING OF DESIGNATED AREA	ESC G7
BLINKING OF DATA IN FIELD BRACKETED BY DELIMITER	ESC ^
BLANKING OF DATA IN FIELD BRACKETED BY DELIMITER	ESC -
VIDEO OFF	ESC ~ 0
RESTORE VIDEO; CURSOR OFF	ESC ~ 1
RESTORE VIDEO; CURSOR STEADY	ESC ~ 2
RESTORE VIDEO; CURSOR BLINK	ESC ~ 3

OPERATOR'S QUICK REFERENCE GUIDE TO CTRL KEY SEQUENCE

Keys Used: CTRL/(ASCII Character)

			FUNCTION		GRAPHIC CHARACTER SET					
HEX			0	1	2	3	4	5	6	7
	LSBs 4321	MSBs 765	000	001			100	101		
0	0000		NUL	DLE			@	P		
1	0001		SOH	DC1			A	Q		
2	0010		STX	DC2			B	R		
3	0011		ETX	DC3			C	S		
4	0100		EOT	DC4			D	T		
5	0101		ENQ	NAK			E	U		
6	0110		ACK	SYN			F	V		
7	0111		BEEP	ETB			G	W		
8	1000		(←) BS	CAN			H	X		
9	1001		(SKIP) HT	EM			I	Y		
A	1010		LF (↓)	SUB			J	Z		
B	1011		VT (↑)	ESC			K	[		
C	1100		FF (→)	FS			L	\		
D	1101		CR	GS			M	]		
E	1110		SO	(HOME) RS			N	^		
F	1111		SI	(NEW LINE) US			O	_		

OPERATOR'S QUICK REFERENCE GUIDE

TO GRAPHIC CHARACTER SET CODES

HEX			FUNCTION		GRAPHIC CHARACTER SET					
			0	1	2	3	4	5	6	7
	LSBs 4321	MSBs 765	000	001	010	011	100	101	110	111
0	0000		NUL	DLE		0	@	P		p
1	0001		SOH	DC1	!	1	A	Q	a	q
2	0010		STX	DC2	"	2	B	R	b	r
3	0011		ETX	DC3	#	3	C	S	c	s
4	0100		EOT	DC4	$	4	D	T	d	t
5	0101		ENQ	NAK	%	5	E	U	e	u
6	0110		ACK	SYN	&	6	F	V	f	v
7	0111		BEEP	ETB	'	7	G	W	g	w
8	1000		(←) BS	CAN	(	8	H	X	h	x
9	1001		(SKIP) HT	EM	)	9	I	Y	i	y
A	1010		LF (↓)	SUB	*	:	J	Z	j	z
B	1011		VT (↑)	ESC	+	;	K	[	k	{
C	1100		FF (→)	FS	,	<	L	\	l	¦
D	1101		CR	GS	-	=	M	]	m	}
E	1110		SO	(HOME) RS	.	>	N	^	n	~
F	1111		SI	(NEW LINE) US	/	?	O	___	o	DEL

OPERATOR'S QUICK REFERENCE GUIDE TO ESCAPE SEQUENCE

Keys Used: ESC/SHIFT/(ASCII Character) or ESC/(ASCII Character)

	ESCAPE SEQUENCE					
HEX	2	3	4	5	6	7
0		0 CLEAR TABS	@ PRINT PROT AS SPACES*	P PRINT PAGE ALL	` POLLING ADDRESS*	p PRINT (UNF)
1	! PROG FNCTN*	1 SET TAB	A	Q CHAR INSERT	a AUX CONTROL*	q INSERT MODE ON
2	" ENABLE KEYBD	2 CLEAR TAB	B SET BLOCK	R LINE DELETE	b STATUS 1 OFF	r INSERT MODE OFF
3	# DISABLE KEYBD	3 SET TAB MODE*	C SET CONV	S SEND MSG FG	c STATUS 1 ON	s SEND MSG ALL
4	$ CLEAR ADM1 M	4 SEND LINE FG	D DUPLEX CONTROL*	T LINE ERASE SP	d STATUS 2 OFF	t LINE ERASE NUL
5	% SET ADM1 M	5 SEND PAGE FG	E LINE INSERT	U PROGM MODE SET	e STATUS 2 ON	u PROGM MODE CLR
6	& SET PROTECT	6 SEND LINE ALL	F MESSAGE TO ROW 25*	V SET PROT COL OF SP	f STATUS 3 OFF	v AUTO PAGE ON
7	' RESET PROTECT	7 SEND PAGE ALL	G ATTRIBUTE CONTROL*	W CHAR DELETE	g STATUS 3 ON	w AUTO PAGE OFF
8	(CLEAR WPROT	8 WRITE SOM (STX)	H	X PROGM MODE CLR	h	x
9	) SET WPROT	9 WRITE (ETX) EOM	I BACKTAB	Y ERASE PAGE SP	i SKIP (TAB)	y PAGE ERASE NUL
A	* CLR ALL TO NUL	: CLR FG NUL	J PAGE BACK	Z MODES CLEAR	j	z
B	+ CLR ALL TO SPACE	; CLR FG SPACE	K PAGE FWD	[PRINT CONTROL*	k	{
C	, CLR ALL TO PROT SP	< STATUS 4 ON	L GO TO PAGE N (1-8)*	\ ENVOKE FUNCTION*	l	| CHANGE BAUD RATE*
D	- LOAD PG & CURS	= LOAD CURSOR	M MULT ESC*	]	m WRITE MULT CHAR*	}
E	. PROGRAM PERSONALITY*	> STATUS 4 OFF	N SET PAGE EDIT	^ BLINK CONTROL	n	~ VIDEO & CURSOR CONTROL
F	/ SEND PG & CURS	? SEND CURSOR	O RESET PAGE EDIT	_ BLANK CONTROL	o DISPLAY PERSONALITY	DEL

*Requires additional characters to complete sequence

OPERATOR'S QUICK REFERENCE GUIDE TO ABSOLUTE CURSOR POSITIONING SEQUENCE AND MODULO NUMBERS

X or Y POSITION	MODULO NUMBER	ASCII CODE	HEX CODE	X or Y POSITION	MODULO NUMBER	ASCII CODE	HEX CODE
1	0	SPACE	20	41	40	H	48
2	1	!	21	42	41	I	49
3	2	"	22	43	42	J	4A
4	3	#	23	44	43	K	4B
5	4	$	24	45	44	L	4C
6	5	%	25	46	45	M	4D
7	6	&	26	47	46	N	4E
8	7	'	27	48	47	O	4F
9	8	(	28	49	48	P	50
10	9	)	29	50	49	Q	51
11	10	*	2A	51	50	R	52
12	11	+	2B	52	51	S	53
13	12	,	2C	53	52	T	54
14	13	-	2D	54	53	U	55
15	14	.	2E	55	54	V	56
16	15	/	2F	56	55	W	57
17	16	0	30	57	56	X	58
18	17	1	31	58	57	Y	59
19	18	2	32	59	58	Z	5A
20	19	3	33	60	59	[	5B
21	20	4	34	61	60	\	5C
22	21	5	35	62	61	]	5D
23	22	6	36	63	62	^	5E
24	23	7	37	64	63	_	5F
25	24	8	38	65	64	`	60
26	25	9	39	66	65	a	61
27	26	:	3A	67	66	b	62
28	27	;	3B	68	67	c	63
29	28	<	3C	69	68	d	64
30	29	=	3D	70	69	e	65
31	30	>	3E	71	70	f	66
32	31	?	3F	72	71	g	67
33	32	@	40	73	72	h	68
34	33	A	41	74	73	i	69
35	34	B	42	75	74	j	6A
36	35	C	43	76	75	k	6B
37	36	D	44	77	76	l	6C
38	37	E	45	78	77	m	6D
39	38	F	46	79	78	n	6E
40	39	G	47	80	79	o	6F

OPERATOR'S QUICK REFERENCE GUIDE TO FUNKEY PROGRAMMING

Keys Used: ESC \ [ASCII Character], [F1 thru F16],
or SHIFT/[F1 thru F16]

FUNKEY	UNSHIFTED ASCII	UNSHIFTED CODE	SHIFTED ASCII	SHIFTED CODE
F1	@	100 0000	`	110 0000
F2	A	100 0001	a	110 0001
F3	B	100 0010	b	110 0010
F4	C	100 0011	c	110 0011
F5	D	100 0100	d	110 0100
F6	E	100 0101	e	110 0101
F7	F	100 0110	f	110 0110
F8	G	100 0111	g	110 0111
F9	H	100 1000	h	110 1000
F10	I	100 1001	i	110 1001
F11	J	100 1010	j	110 1010
F12	K	100 1011	k	110 1011
F13	L	100 1100	l	110 1100
F14	M	100 1101	m	110 1101
F15	N	100 1110	n	110 1110
F16	O	100 1111	o	110 1111

OPERATOR'S QUICK REFERENCE GUIDE TO BUFFERED PRINT MODE

Keys Used: ESC [(ASCII Characters)

FUNCTION	ASCII CHARACTERS
Unbuffered Serial Printing	0P
Unbuffered Parallel Printing	1P
Buffered Serial Printing	2P
Buffered Parallel Printing	3P
Unbuffered Serial Printing Unformatted	0p
Unbuffered Parallel Printing Unformatted	1p
Buffered Serial Printing Unformatted	2p
Buffered Parallel Printing Unformatted	3p

ADM-42
DATA DISPLAY
TERMINAL

To ADM-42 Data Display Terminal Users:

The attached material consists of changes and addenda to the ADM-42 Operators Manual resulting from ADM-42 firmware release V203H.

To verify that your terminal is equipped with the new firmware, before using the terminal:

EXECUTE	ESC o 9
OBSERVE DISPLAY	V203H

Attachment

LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION

CHANGES AND ADDENDA TO ADM-42 OPERATORS MANUAL, ISSUED APRIL 1979

- Page 1-14. Switch Location 15M, revise as follows:
  - SW3, SW4, SW5 (unchanged).
  - SW6 ON enables the expanded input buffer; OFF disables the expanded input buffer. The expanded buffer utilizes the last page of screen memory (in a non-polling environment only).
  - SW7 ON causes data bit 8 to be sent as logic "1"; OFF causes logic "0" to be sent (only when an 8-bit word structure is selected using SW3, SW4, SW5).
  - SW8 (unchanged).
- Page 1-15. Figure 1-6, revise as follows:

SWITCH BANK 3 (LOCATION 2L)										
FUNCTION			SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
PARALLEL PRINTER PORT ENABLED			OFF	Note: SW1 must be ON when PARALLEL PRINTER interface is not installed.						
SERIAL PRINTER PORT ENABLED			ON							
BUFFERED PRINT MODE ENABLED				OFF						
STANDARD PRINT MODES ENABLED				ON						
WORD STRUCTURE										
DATA BITS	PARITY	STOP BITS			SW3	SW4	SW5			
7	EVEN	2			ON	ON	ON			
7	ODD	2			OFF	ON	ON			
7	EVEN	1			ON	OFF	ON			
7	ODD	1			OFF	OFF	ON			
8	NO	2			ON	ON	OFF			
8	NO	1			OFF	ON	OFF			
8	EVEN	1			ON	OFF	OFF			
8	ODD	1			OFF	OFF	OFF			
RESERVED								X	X	
AUXILIARY RCVE INPUT	ENABLED									OFF
	DISABLED									ON

- Page 1-15. Figure 1-6 continued.

SWITCH LOCATION 4A				
FUNCTION		SW1	SW2	SW3
PIN 20 AUX CARRIER DETECT CONTROL	ENABLE	ON		
	DISABLE	OFF		
BUSY ACTIVE HIGH			ON	OFF
BUSY ACTIVE LOW			ON	ON
BUSY NOT ACTIVE			OFF	OFF

- Page 1-16. Option No. 3 - Option Board Installation, revise as follows:

This option basically is the installation of an option PCBA in addition to the standard PCBA in the ADM-42. Once installed, along with the appropriate hardware required to interconnect the various logical bus extensions, several other sub-options are available, as follows:

- Option 3-1 - Parallel Printer Option (not available). This option would provide the same capabilities as the Asynchronous Printer Option, except that a parallel printer would be connected.

- Option 3-2 - Asynchronous Printer Option. This option provides the appropriate logic and hardware for connecting an asynchronous serial printer. Included in this option is the ability to program the printer port so that the printer connected to the port may be controlled directly from the host computer without otherwise affecting ADM-42 operation. Three DIP switches at Option Board Location 4A and six DIP switches at Location 2L control ASYNCHRONOUS PRINTER port operation, as follows:

  Switch Location 4A (Switch Bank 9).

  - SW1 ON enables the Printer Data Carrier Detect (DCD) line to ADM-42 printer control logic via pin 20 of the ASYNCHRONOUS PRINTER port. SW2 OFF disables the line.

- SW2 and SW3 operate in tandem to control the polarity of the BUSY signal, as follows:

  SW2 ON; SW3 OFF = BUSY active high
  SW2 ON; SW3 ON = BUSY active low
  SW2 OFF; SW3 OFF = BUSY not active

Switch Location 2L (Switch Bank 2)

- SW1 ON enables the ASYNCHRONOUS PRINTER port; SW1 OFF enables the PARALLEL PRINTER port, when installed.
- SW2 ON disables the printer buffer and allows the host computer to be connected directly to the serial printer via the ADM-42 without otherwise affecting ADM-42 operation. SW2 OFF enables the printer buffer such that all communication with the printer is through the buffer.
- SW3, SW4, SW5 control the ASYNCHRONOUS PRINTER interface word structure in accordance with the settings shown in figure 1-4.
- SW6, SW7 (reserved).
- SW8 ON disables the ASYNCHRONOUS PRINTER port receive (input) line; SW8 OFF enables the receive (input) line (controlled by SW4A-1).

- Option 3-3 - Synchronous Printer Option (not available). This option would provide the appropriate logic and hardware for the connection of a data set (such as a Bell System Data Set) or teletypewriter to the ADM-42.
- Option 3-4 - Polling Address Option. This option provides the appropriate logic and hardware to accommodate the following polling modes: Select, Group Poll, Sequential Select, Group Select, FAST Select, Broadcast Select, and Multi-Point Contention. Three sets of configuration control DIP switches on the Option PCBA control the Polling Address, as follows:

Switch Location 5L (Switch Bank 4)

- SW1 thru SW7 define the ASCII code for the 1st Polling Address character: ON = logic 0; OFF = logic 1.
- SW8 ON enables the ADM-42 polling function; SW8 OFF disables the polling function.

Switch Location 6L (Switch Bank 5):

- SW1 thru SW7 define the ASCII code for the 2nd Polling Address character: ON = logic 0; OFF = logic 1.
- SW8 ON enables the polling communications buffer; SW8 OFF disables the buffer. The buffer, which utilizes the last two pages (8K) of memory, is used to ensure polling message integrity. The buffer stores and verifies each message. If found to be accurate, it is placed on the screen; if not, the message is rejected. If selected, the last two pages are not displayed.

Switch Location 7L (Switch Bank 6):

- SW1 thru SW7 define the ASCII code for the 1st Group Poll Address character: ON = logic 0; OFF = logic 1.
- SW8 is reserved.

Switch Location 8L (Switch Bank 7):

- SW1 thru SW7 define the ASCII code for the 2nd Group Poll Address character: ON = logic 0; OFF = logic 1.
- SW8 is reserved.

Switch Location 11L (Switch Bank 8):

- SW1 thru SW5 establish the 5-bit Group Select Address code: ON = logic 0; OFF = logic 1.
- SW6, SW7, SW8 are reserved.

- Option 3-5 - Programmable Function Keys Option. This option provides the ability to store either 32 or 64 characters under any function key (FUNKEY) F1 through F16, shifted or unshifted.

Page 2-11, add the following paragraphs:

2.11 CARE OF THE ADM-42 TERMINAL DISPLAY

This portion of the manual provides the required operator instructions pertaining to routine maintenance for the ADM-42 Data Terminal Display. Preventive maintenance procedures are limited primarily to cleaning and inspection steps.

2.11.1 Cleaning

At periodic intervals, clean the exterior housing and lightly dust the unit using a soft brush or damp lint-free cloth. However, paper towels may be substituted if desired. Remove smudges from the CRT exterior screen and the housing with conventional spray cleaners or alcohol. Do not use petroleum base cleaners, such as lighter fluid, as this could be harmful to the painted surface. Be careful not to scratch the CRT screen, and do not use freon cleaners.

This terminal is equipped with a Sunflex non-glare filtered screen. Observe the following precautions when cleaning the screen.

1. Remove dust from the glare filter surface by lightly rubbing with the treated cloth which is supplied with each terminal.

2. Occasionally shake out excess dust from the cloth.

3. To remove pencil marks, grease pen marks, etc. from the filter, us a clean lint-free cloth (NOT THE CLOTH PROVIDED WITH THE TERMINAL) and plain rubbing alcohol, wiping the filter surface while the filter is in place.

2.11.2 Inspection

Periodically, inspect switches and keyboard assembly for freedom of movement. Determine that the intensity of character trace on the CRT screen has not diminished. Any required mechanical and electrical adjustment shall only be preformed by an authorized Lear Siegler service representative.

- Page 2-13, table 2-1, revise SWITCH BANK 1 entry to read as follows:

SWITCH BANK 1 (Location 15M)	Bank of eight two-position switches controls ADM-42 characteristics as follows:

SW1	BREAK Key Enable/Disable
SW2	Refresh Rate = 50/60 Hz
SW3,SW4,SW5	Word Format
SW6	Expanded Input Buffer Enable/Disable
SW7	Data Bit 8 SEND 1 or 0
SW8	Full/Half Duplex

- Page 3-6, table 3-1, Item 10, following the "CONV MODE" entry, add:

SHIFT/CONV MODE	Dual key operation sets ON LINE operation (RECEIVE indicator lit) or OFF LINE operation (RECEIVE indicator not lit). RECEIVE data is inhibited and DTR is dropped.

- Page 3-7, table 3-1, Item 10, after "SHIFT/PRINT" entry, add:

CTRL/PRINT	Send displayed data to printer with protected characters sent as spaces (PRNT in Line 25).

- Page 3-12, revise PAGE FWD and PAGE BACK entries as follows:

  - PAGE FWD shifts the cursor to the last known cursor position of the next succeeding page. When page 8 (or last page) is reached, the shift is to the last known cursor position on page 1. When AUTO PAGE* is set, PAGE FWD shifts the cursor to the HOME position of the next succeeding page; or to the HOME position on page 1 from page 8 (last page).

    NOTE: HOME is the first unprotected location on the page.

  - PAGE BACK shifts the cursor to the last known cursor position of the preceeding page, except that on page 1 the cursor can back up no further than HOME position. When AUTO PAGE is set, PAGE BACK shifts the cursor to the last position on the preceeding page. On page 1 the cursor can back up no further than HOME position.

---

* Set by SHIFT/PAGE BACK
Reset by SHIFT/PAGE FWD

- Page 3-16, par. 3.5 DATA TRANSMISSION CONTROL OPERATIONS, add Note at end of paragraph:

Note

In a non-polling environment, the SHIFT and CONV MODE keys may be used to establish ON-LINE (RECEIVE lit) and OFF-LINE (RECEIVE not lit) operations. ON LINE enables the receive data circuits and causes DTR to be HIGH. OFF LINE disables the receive data circuits and inhibits DTR.

- Page 3-16, par. 3.5.2, add second paragraph to Note, as follows:

Any SEND operation including function keys from the keyboard (except function keys which have been programmed with a "K") will cause the terminal to go ON LINE.

- Page 3-17, add to SEND PAGE entry:

When AUTO PAGE is set, data transmission begins at the first unprotected position on page 1 and continues to the page and cursor location where SEND PAGE was keyed.

- Page 3-17, add to SEND MSG entry:

When AUTO PAGE is set, the cursor backs up to the STX code or to the HOME position on page 1, then all unprotected characters are transmitted until ETX (or end of last page) is encountered.

- Page 3-21, revise Print Format Mode, entry 2, as follows:

2. The cursor is moved to the HOME position (on page 1, if AUTO PAGE is set).

- Page 3-22, revise Free Form Format Mode, entry 3, as follows:

3. Move cursor to HOME position (on page 1, or desired page, if AUTO PAGE is set).

- Page 3-22, immediately following Free Form Format Mode, entry 5, add the following:

Print Unprotect Only Mode allows all unprotected data on a page to be sent to the printer, with protected data sent as spaces. Transmission is initiated by pressing the PRINT key while holding the CTRL key, with the cursor set at the desired stopping point. (Print Unprotect Only Mode can also be entered via a keyboard-initiated or computer-initiated "ESC @" sequence.) Print Unprotect Only Mode operation is the same as for Print Format Mode, above, except that entry 4 reads as follows:

4. Protected characters are sent as spaces; trailing spaces or NULLS on a line are not sent; and attribute control codes are transmitted as spaces. When the last character on each line is sent, the terminal sends "CR LF NULL" before moving to the next line.

- Page 3-24, par. 3.7.2 Status Line Characteristics, revise table entries as follows:

CHARACTER POSITIONS	DISPLAY	STATUS INFORMATION
1-6	PG = X	Current Page No. X, Where "X" may be 1 thru 8
7-10	APG	AUTO PAGE ON

All others unchanged.

- Page 3-35, table 3-3, between "ESC 9" and ESC B" entries, add:

ESC A (1 or 2)	COPY PRINT	Pass all data to PRINT buffer for printing. (Refer to COPY PRINT entry on page 3-53 for details.)

- Page 3-36, table 3-3, revise "ESC @" entry as follows:

ESC @ (CTRL/PRINT)	PRINT PROT AS SPACES	Print protected data as spaces, print unprotect only.

- Page 3-39, Optional FUNKEY Operations, revise the "K" entry to read as follows:

  - A "K" signifies that the message is for display on the ADM-42 screen. Message is transmitted to the host computer only if CONV MODE is set and the keyboard is not locked.

- Page 3-44, Other Personality Characters, revise the "ESC . (7 (HEX))" entry as follows:

  - "ESC . (7 (HEX))" establishes an ASCII character which would be written on the screen when a parity error is sensed (not provided on a standard ADM-42.) The parity error character should be one the user does not normally use. The lower 7 bits define the ASCII replacement character. When the eighth bit is a "1", an error message is displayed in Status Line 25; when a "0", no error message is displayed in Status Line 25.

- Page 3-44, immediately following the "ESC . (9 (HEX))" entry, add the following:

    - "ESC . (A (HEX))" establishes an RTS OFF delay time. The RTS OFF delay time is the time in milliseconds that the RTS line is held high following the transmission of the last character. The table 3-3A shows the HEX code required to obtain the desired RTS OFF delay, in milliseconds; the table also shows the baud rate corresponding to the delay time.

Note

The initial (default) setting of the front panel BAUD RATE switch automatically establishes the appropriate RTS OFF delay time, as shown. Dynamically changing the baud rate by means of an "ESC ! " sequence also changes the RTS OFF delay time correspondingly.

- Page 3-45, revise "ESC . (E (HEX))" listing to read as follows:

HEX CODE	BIT SET=1	CONDITION
E01	0	Inhibits FUNKEY programming from keyboard and display.
E02	1	Prevents cursor from being loaded to a protected location in memory (ADM-2 load cursor mod).
E04	2	Enable PSEUDO SEND/PRINT.
E08	3	Inhibits Auto Video Turnoff.
E10	4	If not in Protect Mode, automatic cursor NEW LINE is inhibited. Cursor remains at column 80 of present line and additional data will overwrite character at column 80.
E20	5	If not in Protect Mode, "CR" from any source will be treated as NEW LINE command.
E40	6	If not in Protect Mode, "CR" from any source causes "LINE ERASE, CR".
E80	7	Prevents keyboard programming of personality changes.

- Page 3-51, par. 3.8.9, add the following entry:

    - ESC @ matches CTRL/PRINT.

- Page 3-52, delete "ESC @" entry, entirely.

Table 3-3A. Chart of RTS OFF Delay Times

HEX CODE	BAUD RATE	RTS DELAY (MILLISECONDS)	HEX CODE	BAUD RATE	RTS DELAY (MILLISECONDS)
AC	50	172	05	1800	5
73	75	115	05	2000	5
50	110	80	04	2400	4
40	135.5	64	04	3600	4
3A	150	58	03	4800	3
1D	300	29	03	7200	3
0F	600	15	03	9600	3
08	1200	8			

- Page 3-53, change the "ESC : (*)" entry to read as follows:

  - "ESC ¦ (*)" dynamically changes the baud rates established by the front panel MODEM and/or ASYNC PRNTR BAUD RATE switches. (Note that the RTS OFF delay time is automatically changed correspondingly.) Table 3-4 shows the baud rates which are available along with the ASCII character "(*)" which may be used to select each baud rate. The table also shows the BAUD RATE switch default setting for each baud rate.

- Page 3-53, following the "ESC ¦ (*)" entry, add the following:

  - COPY PRINT

    Copy Print Mode is a remote function only (not executable from the keyboard) which passes all data, including ESC sequences, to a buffer for the printer port. There are some operational restrictions that must be observed in the use of this feature:

    (1) The buffer uses the last available screen page. If the terminal has two pages installed (standard configuration) and the second page is assigned to an input buffer (see above) then this feature cannot be used.
    (2) The displayed screen must not be the last available page at the time the mode is entered.
    (3) When the mode is entered the last page is taken for the buffer and the page fwd operation is prevented from moving into the page until the buffer is released.

- "ESC A (0)" release the print buffer page, only if the print buffer has completed its data transmission.

- "ESC A (1)" transfers data directly to the print buffer but not to the screen. The PAGE FWD operation is inhibited until the buffer is released. Data will be lost if the buffer overflows.

- "ESC A (2)" performs a function similar to "ESC A (1)", except that the print buffer data is also displayed on the screen.

- "DC4" resets the mode but does not release the page. DC4 is a remote command only.

- Page 3-53, delete paragraph starting with CTRL T/t. Add the following:

  - "ESC A(0)" releases the buffered print page.

- Page 3-54, revise as follows:

  - Table 3-4. Dynamic Baud Rate Codes (unchanged)

- Certain video attributes can be temporarily (dynamically) modified using escape sequences. The selected modification will be only to the end of the line containing the changed attribute. If power is turned off, the video attributes revert to their standard configuration. This mode is entered by executing "ESC G" followed by a character 0 thru 9 or A thru F. When executed at the terminal keyboard, the escape sequence is written for transmission to the computer at the same time the change is accomplished. As shown in the accompanying chart, escape sequences G0 thru G7 are used for changing attributes in only the standard character generator. When an alternate character generator is installed, escape sequences G8, G9, and GA thru GF must be executed to accomplish changes to the alternate character generator attributes. Configuration control switch 1B-1 selects either the blanking or underlining attribute, as shown.

ESCAPE SEQUENCE FOR		ATTRIBUTE SELECTED
STD CHAR GENERATOR	ALT CHAR GENERATOR	
ESC G 0	ESC G 8	Reset to standard video. Used in conjunction with other video escape sequences to establish the limits of the video attribute being changed.
ESC G 1	ESC G 9	Designated area is blanked (SW1 B-1 ON) or underlined (SW1 B-1 OFF).
ESC G 2	ESC G A	Designated area blinks.
ESC G 3	ESC G B	Designated area blinks and is blanked (SW1 B-1 ON) or is underlined (SW1 B1 OFF).
ESC G 4	ESC G C	Designated area is reversed.
ESC G 5	ESC G D	Designated area is reversed and blanked (SW1 B-1 ON) or underlined (SW1 B-1 OFF).
ESC G 6	ESC G E	Designated area is reversed and blinking.
ESC G 7	ESC G F	Designated area blinks and is reversed and is blanked (SW1 B-1 ON) or underlined (SW1 B-1 OFF).

- Page 3-54, add paragraph 3.8.11

3.8.11 Alternate Character Generator Control

When equipped with the alternate character generator, the ADM-42 is capable of creating simple line drawings for display and transmission. Figure 3-4A is a chart which shows the eleven (11) graphic symbols that are available along with the standard keyboard keys used in producing them. In addition, DIP switch 1B-3 is provided which allows the operator to cause the horizontal segment of one symbol to be joined to the horizontal segment of the adjacent symbol. SW1 B-3 OFF causes the symbols to be joined; SW1 B-3 ON separates the symbols.

KEY	SYMBOL (UNSHIFTED)	SYMBOL (WITH SHIFT)	KEY	SYMBOL (UNSHIFTED)	SYMBOL (WITH SHIFT)
22 — ø	N/A		42 { [		
24 ~ ^			43 }]		
25 ¦ \			75 < ,	,	
			76 > .	.	

Figure 3-4A. Chart of Alternate Character Set Symbols

CHANGES TO
APPENDIX A
OPERATOR'S QUICK REFERENCE GUIDES

Page A-1, revise Baud Rate Change Guide as shown:

OPERATOR'S QUICK REFERENCE GUIDE TO BAUD RATE CHANGE
Keys Used: ESC ¦ (ASCII Character)

EQUIVALENT BAUD RATE SWITCH POSITION	BAUD RATE	ASCII CHARACTER	
		MODEM PORT	ASYNC PRINTER PORT
0	50	@	`
1	75	A	a
2	110	B	b
3	134.5	C	c
4	150	D	d
5	300	E	e
6	600	F	f
7	1200	G	g
8	1800	H	h
9	2000	I	i
10	2400	J	j
11	3600	K	k
12	4800	L	l
13	7200	M	m
14	9600	N	n

Page A-2/A-3, revise Personality Change Guide as shown:

OPERATOR'S QUICK REFERENCE GUIDE TO PERSONALITY CHANGE

Keys Used: ESC . (FUNCTION CODE) (NEW CHAR) BYTES 0-F
ESC . .(FUNCTION CODE) (NEW CHAR) BYTES 10-1F

FUNCTION	FUNCTION CODE (KEYBD) ASCII	NEW CHARACTER OR HEX NUMBER	STD DEFAULT
Escape Leadin Character	ESC . 0	Enter HEX code associated with desired ASCII character.	ESC
End Block Character	ESC . 1		CR
2nd End Block Character	ESC . 2		NULL
New Line Character	ESC . 3		US
2nd New Line Character	ESC . 4		NULL
Field Separator Character	ESC . 5		FS
Function Leadin Character	ESC . 6		SOH
Parity Character	ESC . 7		NULL
Replacement Character	ESC . 8		SPACE
RTS-START Delay Time	ESC . 9		00
RTS-OFF Delay Time	ESC . A	Variable automatically determined by baud rate.	00
Polling Option Variant	ESC . B (*)	HEX CODE (*)	
		01 = Headers transmitted and required for reception	OFF
		02 = Any key to initiate LOCAL	OFF
		04 = Remote FAST SELECT command is conditional	OFF
		08 = Return to LOCAL after receive	OFF
		10 = Last character not transmitted under cursor	OFF
		20 = Printer buffer enabled	OFF
		40 = Communications buffer enabled (last two pages)	OFF
Polling Transmission Number	ESC . C (*)	DEC. No. (*)	
		00 = Transmission number inhibited (default)	OFF
		01-09 = Number of transmissions before recycle	01

OPERATOR'S QUICK REFERENCE GUIDE TO PERSONALITY CHANGE (cont'd)

FUNCTION	FUNCTION CODE (KEYBD) ASCII	NEW CHARACTER OR HEX NUMBER	STD DEFAULT
Power-Up Default Modulus Tabs	ESC . D (*)	*Enter number corresponding to desired modulo tab positions on page A-8.	OFF
		HEX CODE (*)	
Inhibit Dynamic change of characteristics	ESC . E (*)	01 = Inhibit FUNKEY programming and display	OFF
		02 = Force skip protected character after load cursor operation	OFF
		04 = Enable PSEUDO SEND/ PRINT	OFF
		08 = Inhibit Auto Video Turn-off	ON
		10 = Inhibit auto line wrap	OFF
		20 = Auto NEW LINE with CR	OFF
		40 = Auto LINE ERASE (to personality) with CR	OFF
		80 = Inhibit Personality Programming from K/B	OFF
Video Attribute to Status Line 25	ESC . F (*)	00 = Reset to standard video	OFF
		01 = Underline or blank	OFF
		02 = Blink	ON
		03 = Blink and blank or underline	OFF
		04 = Reverse	OFF
		05 = Reverse and underline or blank	OFF
		06 = Reverse and blink	OFF
		07 = Reverse, blink, and blank or underline	OFF

OPERATOR'S QUICK REFERENCE GUIDE TO PERSONALITY CHANGE (cont'd)

FUNCTION	FUNCTION CODE (KEYBD) ASCII	NEW CHARACTER OR HEX NUMBER	STD DEFAULT
Miscellaneous changes using 2nd Personality byte	ESC . . 0 (*)	HEX CODE (*)	
		01 = ERASE LINE operation turns off Write Protect.	OFF
		02 = ERASE PAGE operation turns off Write Protect (See Note).	ON
		04 = Reserved	OFF
		08 = Disables scroll operation of unprotected page.	OFF
		10 = Inhibits transmission of END LINE sequence when Protect Mode is set	OFF
		20 = Protected field delimiter "FS" is sent after the unprotected field, rather than after protected fields.	OFF
		40 = Enables assignment of replacement character to CLEAR TO SPACES operation using byte 8.	OFF
		80 = Enables assignment of replacement character to ERASE TO SPACES operation using byte 8.	OFF
Power up Default conditions (not dynamically set)	ESC . . 1 (*)	HEX CODE (*)	
		01 = CAP LOCK is set.	ON
		02 = Reserved	OFF
		04 = CONV MODE is set.	OFF
		All Others = Reserved	OFF

NOTE: When this personality bit is set to 0, typing PAGE ERASE may cause video to turn off, if AUTO PAGE PROTECT MODE and WRITE PROTECT are also all set. Video may be restored by executing "ESC ~ 2".

Page A-3, change chart as follows:

from: 44 T to: 54 T

Page A-4, revise Video Attribute Control Sequence Guide, as shown:

OPERATOR'S QUICK REFERENCE GUIDE TO
VIDEO ATTRIBUTE CONTROL SEQUENCE

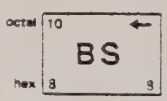
FUNCTION	STD. CHAR. GEN.	ALT. CHAR. GEN.
RESET TO STANDARD VIDEO	ESC G 0	ESC G 8
BLANKING OR UNDERLINING OF DESIGNATED AREA	ESC G 1	ESC G 9
BLINKING OF DESIGNATED AREA	ESC G 2	ESC G A
BLINKING AND BLANKING OR UNDERLINING OF DESIGNATED AREA	ESC G 3	ESC G B
REVERSING OF DESIGNATED AREA	ESC G 4	ESC G C
REVERSING AND BLANKING OR UNDERLINING OF DESIGNATED AREA	ESC G 5	ESC G D
REVERSING AND BLINKING OF DESIGNATED AREA	ESC G 6	ESC G E
REVERSING, BLINKING, AND BLANKING OR UNDERLINING OF DESIGNATED AREA	ESC G 7	ESC G F
BLINKING OF DATA IN FIELD BRACKETED BY DELIMITER	ESC ^	ESC ^
BLANKING OR UNDERLINING OF DATA IN FIELD BRACKETED BY DELIMITER	ESC -	ESC -
VIDEO OFF	ESC ~ 0	ESC ~ 0
RESTORE VIDEO; CURSOR OFF	ESC ~ 1	ESC ~ 1
RESTORE VIDEO; CURSOR STEADY	ESC ~ 2	ESC ~ 2
RESTORE VIDEO; CURSOR BLINK	ESC ~ 3	ESC ~ 3

Page A-6, revise Graphic Character Set Codes Guide as shown:

ASCII & LSI CONTROL CODE CHART

BITS B7 B6 B5 / B4 B3 B2 B1	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
	CONTROL		NUMBERS SYMBOLS		UPPER CASE		LOWER CASE	
0 0 0 0	0 NUL 0 0	20 DLE 10 16	40 SP 20 32	60 0 30 48	100 @ 40 64	120 P 50 80	140 ` 60 96	160 p 70 112
0 0 0 1	1 SOH 1 1	21 DC1 11 17	41 ! 21 33	61 1 31 49	101 A 41 65	121 Q 51 81	141 a 61 97	161 q 71 113
0 0 1 0	2 STX 2 2	22 DC2 12 18	42 " 22 34	62 2 32 50	102 B 42 66	122 R 52 82	142 b 62 98	162 r 72 114
0 0 1 1	3 ETX 3 3	23 DC3 13 19	43 # 23 35	63 3 33 51	103 C 43 67	123 S 53 83	143 c 63 99	163 s 73 115
0 1 0 0	4 EOT 4 4	24 DC4 14 20	44 $ 24 36	64 4 34 52	104 D 44 68	124 T 54 84	144 d 64 100	164 t 74 116
0 1 0 1	5 ENQ 5 5	25 NAK 15 21	45 % 25 37	65 5 35 53	105 E 45 69	125 U 55 85	145 e 65 101	165 u 75 117
0 1 1 0	6 ACK 6 6	26 SYN 16 22	46 & 26 38	66 6 36 54	106 F 46 70	126 V 56 86	146 f 66 102	166 v 76 118
0 1 1 1	7 BEL 7 7	27 ETB 17 23	47 ' 27 39	67 7 37 55	107 G 47 71	127 W 57 87	147 g 67 103	167 w 77 119
1 0 0 0	10 ← BS 8 8	30 CAN 18 24	50 (28 40	70 8 38 56	110 H 48 72	130 X 58 88	150 h 68 104	170 x 78 120
1 0 0 1	11 TAB HT 9 9	31 EM 19 25	51) 29 41	71 9 39 57	111 I 49 73	131 Y 59 89	151 i 69 105	171 y 79 121
1 0 1 0	12 ↓ LF A 10	32 SUB 1A 26	52 * 2A 42	72 : 3A 58	112 J 4A 74	132 Z 5A 90	152 j 6A 106	172 z 7A 122
1 0 1 1	13 ↑ VT B 11	33 ESC 18 27	53 + 2B 43	73 ; 3B 59	113 K 4B 75	133 [5B 91	153 k 6B 107	173 { 7B 123
1 1 0 0	14 → FF C 12	34 FS 1C 28	54 , 2C 44	74 < 3C 60	114 L 4C 76	134 \ 5C 92	154 l 6C 108	174 ¦ 7C 124
1 1 0 1	15 RTN CR D 13	35 GS 1D 29	55 - 2D 45	75 = 3D 61	115 M 4D 77	135] 5D 93	155 m 6D 109	175 } 7D 125
1 1 1 0	16 SO E 14	36 HOME RS 1E 30	56 . 2E 46	76 > 3E 62	116 N 4E 78	136 ^ 5E 94	156 n 6E 110	176 ~ 7E 126
1 1 1 1	17 SI F 15	37 NEW LINE US 1F 31	57 / 2F 47	77 UNL ? 3F 63	117 O 4F 79	137 _ 5F 95	157 o 6F 111	177 RUBOUT (DEL) 7F 127

KEY

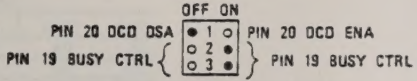


OPTION PWB 129832-5

S8-2	S8-3	FUNCTION
ON	ON	PIN 19 BUSY LOW
ON	OFF	PIN 19 BUSY HIGH
OFF	ON	NOT ALLOWED
OFF	OFF	BUSY NOT ACTIVE*

*UNIT SENSES PRINTER AS NEVER BUSY

@4A
S8 - PRINTER

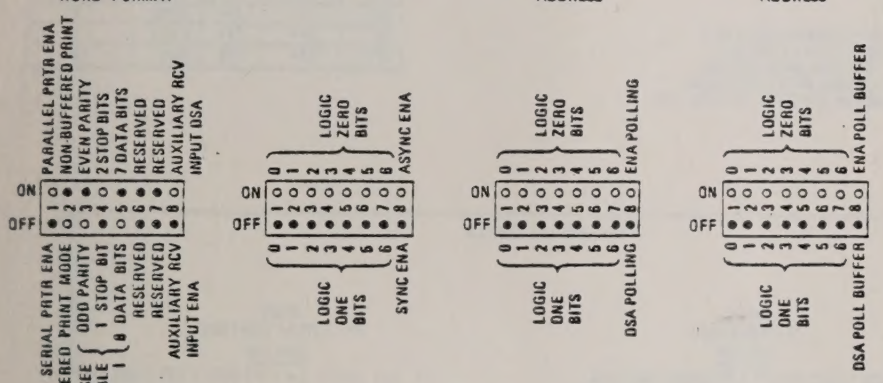


@2L
S1 - SERIAL PRINTER WORD FORMAT

@3L
S2 - SYNC/ASYNC MODE

@5L
S3 - 1ST POLLING ADDRESS

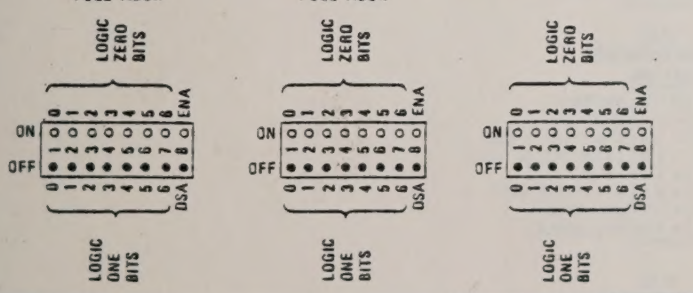
@6L
S4 - 2ND POLLING ADDRESS



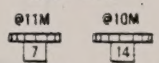
@8L
S5 - 1ST GROUP POLL ADDR

@9L
S6 - 2ND GROUP POLL ADDR

@11L
S7 - GROUP SELECT ADDR



BAUD RATE



S4 - PRINTER S3 - MODEM
(STD DEFAULT SETTING)

BAUD RATE	SWITCH POSITION
50	0
75	1
110	2
134.5	3
150	4
300	5
600	6
1200	7
1800	8
2000	9
2400	10
3600	11
4800	12
7200	13
9600	14
X	15

ADM-42

CONFIGURATION CONTROL SWITCH SETTINGS

CAUTION

IN COLD CLIMATES, CARE SHOULD BE EXERCISED TO ALLOW THE TEMPERATURE OF THE TERMINAL TO EQUALIZE WITH ROOM TEMPERATURE BEFORE REMOVING THE UNIT FROM THE SHIPPING CARTON. THIS WILL PREVENT MOISTURE FROM CONDENSING ON A COLD TERMINAL EXPOSED TO WARM AIR. AVOID OPERATING THE UNIT ON A SOFT SURFACE, SUCH AS CARPETING, WHICH WOULD OBSTRUCT THE FLOW OF COOLING AIR UP THROUGH THE BOTTOM OF THE CHASSIS. THIS COULD RESULT IN OVERHEATING AND DAMAGE TO THE UNIT.

THE LOCATIONS AND FACTORY SETTINGS OF THE CONFIGURATIONS CONTROL SWITCHES SHOWN APPLY TO:

PRINTED WIRING BOARD 129812-5
OPTION PRINTED WIRING BOARD 129832-5

IF YOU NEED TO MAKE CHANGES, PLEASE REFER TO THE USERS REFERENCE MANUAL.

NOTES:
1. SWITCH POSITION ON = CLOSED = LOGICAL 0
2. SWITCH POSITION OFF = OPEN = LOGICAL 1
3. ● = STANDARD ○ = OPTIONAL ⊗ = RESERVED
4. EXECUTE TERMINAL RESET AFTER CHANGING ANY SWITCH POSITION IN ORDER TO REINITIALIZE ADM-42 LOGIC

TABLE 1

SW-3	SW-4	SW-5	PARITY	STOP	BITS
ON	ON	ON	EVEN	2	7
OFF	ON	ON	ODD	2	7
ON	OFF	ON	EVEN	1	7 STD
OFF	OFF	ON	ODD	1	7
ON	ON	OFF	NONE	2	8
OFF	ON	OFF	NONE	1	8
ON	OFF	OFF	EVEN	1	8
OFF	OFF	OFF	ODD	1	8

STANDARD PWB 129812-5

SEE TABLE 2

@15A
S2 - INTERFACE

	OFF ON	
RS-232 XMIT DIS	○ 1 ●	RS-232 XMIT ENA
DIR CONN XMIT DIS	● 2 ○	DIR CONN XMIT ENA
CURR LOOP/RS232 RCV DSA	○ 3 ●	CURR LOOP/RS232 RCV ENA
DIR CONN RCV DIS	● 4 ○	DIR CONN RCV ENA
CURR LOOP XMIT DIS	● 5 ○	CURR LOOP XMIT ENA
SCF DIS	● 6 ○	SCF ENA (N/A)

@16M
S7 - DISPLAY CONTROL

	OFF ON	
ATT NOT DSPLY	● 1 ○	DISPLY ATT CODE
ENA ALT CHAR EXT	○ 2 ●	DIS ALT CHAR EXT
DSPLY NULL AS NULL	○ 3 ●	DSPLY NULL AS SPACE

@12M
S5 - WORD STRUCTURE

	OFF ON		
BRK DIS	○ 1 ●	BRK ENA	
60 HZ	● 2 ○	50 HZ	
ODD PAR	○ 3 ●	EVEN PAR	SEE TABLE 1
1 STOP BIT	● 4 ○	2 STOP BITS	
8 BITS	○ 5 ●	7 BITS	
NORM RCV BUFF	● 6 ○	EXPAND RCV BUFF	
SEND BIT 8 = 0	● 7 ○	SEND BIT 8=1	
HALF DUPLEX	● 8 ○	FULL DUPLEX	

@14M
S6 - ATTRIBUTE CONTROL

	OFF ON	
ADM-42 ATT MODE	● 1 ○	ADM 2 ATT MODE
PAGE ATT	● 2 ○	LINE ATT
BLANK ATT	○ 3 ●	UNDERLINE ATT
RESERVED	● 4 ●	RESERVED
RESERVED	● 5 ●	RESERVED
RESERVED	● 6 ●	RESERVED
RESERVED	● 7 ●	RESERVED
RESERVED	● 8 ●	RESERVED

TABLE 2

S2-1	S2-2	S2-3	S2-4	S2-5	FUNCTION
ON	OFF	ON	OFF	OFF	RS-232 ENABLED (STD)
OFF	OFF	ON	OFF	ON	CURRENT LOOP ENABLED
OFF	ON	OFF	ON	OFF	DIRECT CONNECT ENABLED

ALL OTHER POSITIONS NOT ALLOWED

LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION
714 NORTH BROOKHURST STREET, ANAHEIM, CALIFORNIA 92803
PHONE: (714) 774-1010 TELEX: 65-5444 TWX 910-591-1157